JULY 19, 1941

1427

The Library of Congress
Central Serial Record
Received
OCT 14 1941
Copy
32511

THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2.
Telegrams: LANCET, RAND, LONDON. Telephone: TEMPLE BAR 7228 and 7229.

No. III. OF VOL. II., 1941. LONDON, SATURDAY, JULY 19, 1941. Pp. 72—Price 1s.
No. 6151. VOL. CCXLI. Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription: Inland £1 2s. Abroad £1 10s.

OXFORD MEDICAL PUBLICATIONS

SEE PAGE 2

In Two Volumes. SELECTED WRITINGS OF
JOHN HUGHLINGS JACKSON,
M.D., F.R.C.P., F.R.S.
I.—EPILEPSY AND EPILEPTIFORM CONVULSIONS.
II.—EVOLUTION AND DISSOLUTION OF THE NERVOUS SYSTEM: SPEECH: VARIOUS PAPERS: ADDRESSES AND LECTURES.
Edited by JAMES TAYLOR, M.D., F.R.C.P.
With the advice and assistance of GORDON HOLMES, M.D., F.R.C.P., and F. M. R. WALSHE, M.D., F.R.C.P.
Over 500 pages in each vol. Price 25s. net each; postage extra (inland 9d., abroad 10d.).
Hodder & Stoughton Ltd., 20, Warwick-square, E.C.4.

Second Edition. Pp. 190 + viii. 6s. net. Recently Published.
PRINCIPLES OF MEDICAL STATISTICS
By A. BRADFORD HILL, D.Sc., Ph.D.
The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2.

DISEASES OF THE THYROID GLAND.
WITH SPECIAL REFERENCE TO THYROTOXICOSIS.
By CECIL A. JOLL, M.S., B.Sc., F.R.C.S. (Eng.).
Crown 4to. Fully Illustrated. £3 3s. net.
"Mr. Joll has presented his fellow practitioners and students with a monumental volume. They need not trouble to search the literature published up to the time this volume went to press, for they will find everything relevant within its covers."
—BRITISH JOURNAL OF SURGERY.
William Heinemann (Medical Books) Ltd., 99, Great Russell-street, London, W.C.1.

With 132 Illustrations. Demy 8vo. 15s. net; postage 7d.
CHEST DISEASE IN GENERAL PRACTICE
By PHILIP ELLMAN, M.D., M.R.C.P.
Foreword by Prof. S. LYLE CUMMINS, C.B., C.M.G., M.D.
London: H. K. Lewis & Co. Ltd., 136 Gower-street, W.C.1.

LANCET WAR PRIMER
WOUND INFECTION
Edited by W. H. OGILVIE
96 pp. 2s. 6d. net Plus 3d. postage
The Lancet Ltd., 7, Adam-street, Adelphi, W.C.2.

RADIOTHERAPY IN THE DISEASES OF WOMEN.
By MALCOLM DONALDSON, B.A. (Cantab.), F.R.C.S. (Eng.), M.B., Ch.B. (Cantab.)
Physician Accoucheur with Charge of Out-patients, St. Bartholomew's Hospital; Consulting Gynæcologist, Royal Northern Hospital, &c.
Demy 8vo. 148 pages. 11 Illustrations in the Text; 2 Plates, one in Colour. Price 7s. 6d. net; postage 7d.
Hodder & Stoughton Ltd., 20, Warwick-square, E.C.4.

Free to the Medical Profession on request. Cloth bound Ed. 5s.
ARTIFICIAL LIMBS.
"SOLVITUR AMBULANDO."
A Symposium on Prosthetic Achievement.
Pp. 72. 37 Coloured Plates.
"I congratulate you on this interesting, instructive, and artistic production. I consider it to be a very great addition to my library."—M.B., Ch.B., F.R.C.S.
J. E. Hanger & Co., Ltd., 7, Roehampton House, Roehampton, S.W.15.

SAUNDERS' BOOKS
SEE ADVERTISING PAGE 3 4892

PROBLEMS OF
ANÆSTHESIA
IN GENERAL PRACTICE
By D. H. LUKIS, M.D., B.S.Lond.,
Late Hon. Anæsthetist, South London Hospital; late Clinical Assistant, Ear, Nose, and Throat Department, Queen's Hospital for Children; Hon. Medical Officer, Kingston Victoria Hospital.
Demy 8vo. 7s. 6d. net (postage extra). 158 + vi pages.
Hodder & Stoughton Ltd., 20, Warwick-square, E.C.4.

AN AYLESBURY BROADSIDE
From all Booksellers. Price 3d.
Setting out, from the medical standpoint, the grounds, social, economic and physiological, for the immediate grant of family allowances on a national scale.
The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2.

ESSENTIALS OF GENERAL ANÆSTHESIA
By R. R. MACINTOSH, M.D., D.A., and F. B. PRATT, M.D., D.A.
350 pp. profusely illustrated. 25s. net; postage 7d.
"... the best textbook on Anæsthetics ..."—BRIT. DENT. JOUR.
BLACKWELL SCIENTIFIC PUBLICATIONS · OXFORD

Pp. 328 + xii. 12s. 6d. net.
INTRODUCTION TO
DISEASES OF THE CHEST.
By JAMES MAXWELL, M.D. (Lond.), F.R.C.P. (Lond.)
Hodder & Stoughton Ltd., 20, Warwick-square, E.C.4.

PROGNOSIS. VOLS. ONE AND TWO
Price 10s. 6d. each net (postage 7d. each extra).
Companion Volumes to the "Modern Technique in Treatment" and "Clinical Interpretation of Aids to Diagnosis" Series.
The 124 articles of the series have been collected in book form in two volumes, which are fully indexed and cross-referenced, and broadly classified into groups to facilitate quick reference.
The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2.

OXFORD WAR MANUALS

This series is the modern equivalent of the OXFORD WAR PRIMERS published during 1914–1918. Like them, the 1941 manuals are highly condensed practical guides to the treatment of injuries and diseases brought about by war conditions. They are planned for the use of medical personnel attached to the uniformed forces, but in the present war many of the subjects discussed will of course be of equal interest to civilian doctors. Announcements of titles and other details will be made from time to time on our regular advertisement page.

OXFORD UNIVERSITY PRESS

CLIMACTERIC SYNDROME RELIEVED

"High Doses of Oestrin are usually unnecessary, at any rate for the commoner menopausal symptoms—such as vasomotor disturbances—and consequently oestrin injections are, fortunately, seldom required. It has been my practice to begin with doses of about 500 I.U. daily by mouth. If this does not control the symptoms the dose is raised to 1,000 . . . this is usually completely effective. There are, of course, certain more severe sequelæ of the menopause, which demand much higher doses . . . Pruritus, Kraurosis, Leukoplakia vulvæ, fall into this class and, provided sufficiently high doses are given, the results are little short of miraculous."

PROC. ROY. SOC. MED. Vol. XXIX. Page 1094

MENFORMON TABLETS

ŒSTRONE

ORGANON

BRETTENHAM HOUSE, LONDON, W.C.2

Telephone: Temple Bar 6785

Agents throughout the British Empire and Countries abroad. We shall be pleased to send clinical samples on request.

Telegrams: Menformon, Rand, London

JULY 19, 1941

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, CHEMISTRY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 6151 LONDON: SATURDAY, JULY 19, 1941 CCXLI

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

The Quantitative Administration of Ether Vapour: Crystals as a Heat Reservoir.
By Prof. R. R. MACINTOSH, D.M., D.A., and K. MENDELSSOHN, PH.D. (*with diagrams*) 61

The Oxford Vaporiser No. 1: Details of Construction—Operation of the Vaporiser.
By H. G. EPSTEIN, PH.D., R. R. MACINTOSH and K. MENDELSSOHN (*with diagrams*) 62

The Oxford Vaporiser No. 2.
By S. L. COWAN, D.SC., R. D. SCOTT, M.B. and S. F. SUFFOLK, B.SC. (*with diagrams*) 64

The Performances of the Oxford Vaporisers with Ether: Clinical Performances of Vaporisers No. 1 and No. 2.
By H. G. EPSTEIN and Flying Officer E. A. PASK, M.B., D.A. (*with charts*) 66

Trichiniasis: Clinical Manifestations and Diagnosis.
By PAUL B. BEESON, M.D. 67

Blood-picture in Trichiniasis: Analysis of Results—Morphology.
By B. L. DELLA VIDA, M.D. and S. C. DYKE, F.R.C.P. (*with chart*) ... 69

Electrical Convulsion Therapy.
By Major A. M. WYLLIE, M.D. 71

SPECIAL ARTICLES

Air-raid Strain in Mental-Hospital Admissions.
By I. ATKIN, M.D. 72

The Biology of Epidemics: Abstract of Croonian Lecture given by Prof. W. W. C. TOPLEY 82

Scotland: Admission to E.M.S. Hospitals—Summer Graduation in Aberdeen—Honyman Gillespie Lectures 82

PARLIAMENT

Notes on Current Topics: Pharmacy and Medicines Bill—The Seaman's Diet—Extended Benefits 83

Question Time: Orthopædic Treatment in Scotland—Venereal Disease in Jamaica—National Health Insurance Benefits—Alien Doctors—Price and Delivery of Milk—Occupational Therapy in Mental Hospitals 84

OBITUARY

Sir William Willcox, F.R.C.P. (*with portrait*) .. 88

Frank George Layton, M.R.C.S., J.P. (*with portrait*) 88

Lieut.-Colonel Edmund Tytler Burke, M.B. (*with portrait*) 88

Major-General Owen Edward Pennefather Lloyd, V.C., L.R.C.P. 89

Surgeon Lieutenant Archibald Thomas Leggate, M.B. (*with portrait*) 89

James Hussey, M.D. 89

LEADING ARTICLES

TAMING THE ANÆSTHETIC. 75

OVERDUE LEGISLATION? .. 75

LAVAGE RETURNS 76

KEEPING COOL 77

ANNOTATIONS

Tobacco and Cancer 78

Transplanted Teeth 78

Pill's Progress 79

Methæmalbumin 79

First-aid for Burns 80

Guy's in the Wilderness .. 80

The King and the College of Surgeons 80

LETTERS TO THE EDITOR

Saving on Drugs (Dr. W. Allen Daley) 85

Short Œsophagus and Peptic Ulcer of the Œsophagus (Sir Arthur Hurst, F.R.C.P.) 85

The Frontal Lobes (Dr. C. R. Birnie) 85

Future of General Practice (Dr. Henry H. MacWilliam) 86

Village Settlements in Wartime (Dr. J. B. McDougall) 86

McArthur Hernioplasty (Mr. J. A. Martinez, F.R.C.S.) 87

Suppression of Urine in Crush Œdema (Dr. Helen Russell) 87

Enteroblus and Excreta (Dr. Bryce Orme) 87

Pain in Acute Appendicitis (Mr. Zachary Cope, F.R.C.S.) 87

REVIEWS OF BOOKS

Human Biology. By Prof. G. A. Baitsell 74

The Scientific Photographer. By A. S. C. Lawrence, PH.D. 74

Food: The Deciding Factor. By Frank Wokes, PH.D. 74

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents 81

MEDICAL NEWS

University of Cambridge .. 89

Royal College of Surgeons of England 89

University of Aberdeen ... 89

National University of Ireland 89

Medical Research Council of Ireland 90

Royal Faculty of Physicians and Surgeons of Glasgow 90

Medical Honour 90

Diphtheria Immunisation 90

London Chest Hospital.... 90

Medical Society for the Study of Venereal Diseases 90

St. John Ophthalmic Hospital, Jerusalem.... 87

Service Casualties..... 87

Soviet War Surgery..... 87

Awards in the R.A.M.C.... 80

Infectious Disease in England and Wales 90

Appointments, Births, Marriages and Deaths .. 90

THE LONDON AND COUNTIES
MEDICAL PROTECTION SOCIETY, Ltd.

President: SIR CUTHBERT S. WALLACE, K.C.M.G., C.B., F.R.C.S.

Members receive UNLIMITED INDEMNITY (subject to the Articles of Association) against damages and costs in cases undertaken on their behalf and advice and assistance in all matters of professional difficulty.

The estate of a deceased member is similarly protected.

Assets exceed £80,000

Annual Subscription £1

Entrance Fee 10s.
(REMITTED TO RECENTLY QUALIFIED PRACTITIONERS)

Full particulars and application form from:—
Dr. R. W. DURAND, Secretary, VICTORY HOUSE, LEICESTER SQUARE, W.C.2. — Gerrard 4563, 4814.

OXFORD MEDICAL PUBLICATIONS

THE EARLY TREATMENT OF WAR WOUNDS
By WILLIAM ANDERSON, O.B.E. (Mil.), M.B., Ch.B., F.R.C.S.
Pp. 108 — 12 Illustrations — 5s. net

THE TREATMENT OF BURNS
By A. B. WALLACE, M.B., F.R.C.S., M.Sc.
Pp. 128 — 16 Illustrations — 5s. net

GYNÆCOLOGICAL OPERATIONS
By J. LYLE CAMERON, M.D., F.R.C.S., F.A.C.S., M.R.C.O.G.
Pp. 212 — 26 Illustrations — 21s. net

TECHNIQUE OF GASTRIC OPERATIONS
By RODNEY MAINGOT, F.R.C.S.
Pp. 252 — 54 Illustrations — 15s. net

BLOOD TRANSFUSION
By VICTOR HORSLEY RIDDELL, M.D., F.R.C.S.
Pp. 384 — 65 Illustrations (9 in colour) — 21s. net

THE COLLECTED PAPERS OF WILFRED TROTTER, F.R.S.
Pp. 208 — 10s. 6d. net

PRINCIPLES AND PRACTICE OF DIPHTHERIA IMMUNIZATION
By J. TUDOR LEWIS, M.D., D.P.H.
Pp. 170 — 13 Illustrations — 8s. 6d. net

FRACTURES
By GEORGE PERKINS, M.Ch., F.R.C.S.
Pp. 394 — 401 Illustrations — 20s. net

PHARMACOLOGY
By J. H. GADDUM, Sc.D., M.R.C.S., L.R.C.P.
Pp. 417 — 74 Illustrations — 17s. 6d. net

VIRUS DISEASES OF MAN
By C. E. VAN ROOYEN, M.D., and A. J. RHODES, M.B., B.Ch., M.R.C.P.E.
Pp. 950 — 59 Illustrations — 4 Colour Plates — 63s. net

THE HEALTH AND EFFICIENCY OF MUNITION WORKERS
By H. M. VERNON, M.D.
Pp. 144 — 15 Illustrations — 8s. 6d. net

PULMONARY TUBERCULOSIS
By G. G. KAYNE, M.D., M.R.C.P., D.P.H., W. PAGEL, M.D., and the late L. O'SHAUGHNESSY
Pp. 580 — 365 Illustrations — 42s. net

APPLIED PHYSIOLOGY
By SAMSON WRIGHT, M.D., F.R.C.P.
7th Edition — Pp. 827 — 367 Illustrations — 5 Colour Plates — 25s. net

DISEASES OF THE NERVOUS SYSTEM
By W. RUSSELL BRAIN, D.M., F.R.C.P.
2nd Edition — Pp. 970 — 76 Illustrations — 30s. net

Oxford University Press

SAUNDERS' NEW BOOKS

Textbook of Physiology

By W. H. HOWELL, PH.D., M.D., Emeritus Professor of Physiology, Johns Hopkins University. 1,117 pages, 6″ × 9″, 330 illustrations, many in colours. Fourteenth Edition. Cloth, 37s. 6d. net.

Textbook of Biochemistry

By BENJAMIN HARROW, PH.D., Professor of Chemistry, City College, College of the City of New York. 439 pages, 6¼″ × 9¼″. Second Edition, Revised. Cloth, 20s. net.

Clinical Diabetes Mellitus

By RUSSELL M. WILDER, M.D., PH.D., F.A.C.P., Professor and Chief of Department of Medicine, the Mayo Foundation, Rochester, Minnesota; Head of Section on Metabolism Therapy, Division of Medicine, the Mayo Clinic. 459 pages, 6″ × 9¼″, illustrated. Cloth, 30s.

Electrocardiography in Practice

By ASHTON GRAYBIEL, M.D., Instructor in Medicine, Courses for Graduates; and PAUL D. WHITE, M.D., Lecturer, Harvard Medical School. 319 pages, 11¼″ × 8¼″, with 272 electrocardiograms. 30s.

Clinical Heart Disease

By SAMUEL A. LEVINE, M.D., F.A.C.P., Assistant Professor of Medicine, Harvard Medical School. 495 pages, 6″ × 9″, illustrated. Second Edition. Cloth, 30s.

Office Urology

By P. S. PELOUZE, M.D., Assistant Professor of Urology, University of Pennsylvania. 766 pages, 6¼″ × 9¼″, with 443 illustrations, 19 in colour. Cloth, 50s.

Injection Treatments

By PENN RIDDLE, M.D., Assistant Professor of Clinical and Operative Surgery, Baylor University College of Medicine. 290 pages, 6¼″ × 9¼″, 153 illustrations. Cloth, 27s. 6d.

W. B. SAUNDERS COMPANY, Ltd., 7, Grape Street, London, W.C.2

A fourth generation prescribes

The popularity of this mild antacid and gentle laxative is due largely to the favourable opinion of three generations of Medical practitioners. A teaspoonful or so of Dinneford's, given when the child is restless, has been in line with "Doctor's Orders" for over one hundred years.

DINNEFORD'S
pure fluid
MAGNESIA

FOR DISORDERS OF

THE MENOPAUSE

'Ovendosyn' is designed for the complete control of physical and mental symptoms at the menopause. Its special claim to consideration lies in the fact that this unique combination of stilbœstrol and calcium ensures all the advantages of the synthetic œstrogenic agent and at the same time reduces unpleasant side-effects to a minimum.

'OVENDOSYN'

BRAND

TABLETS

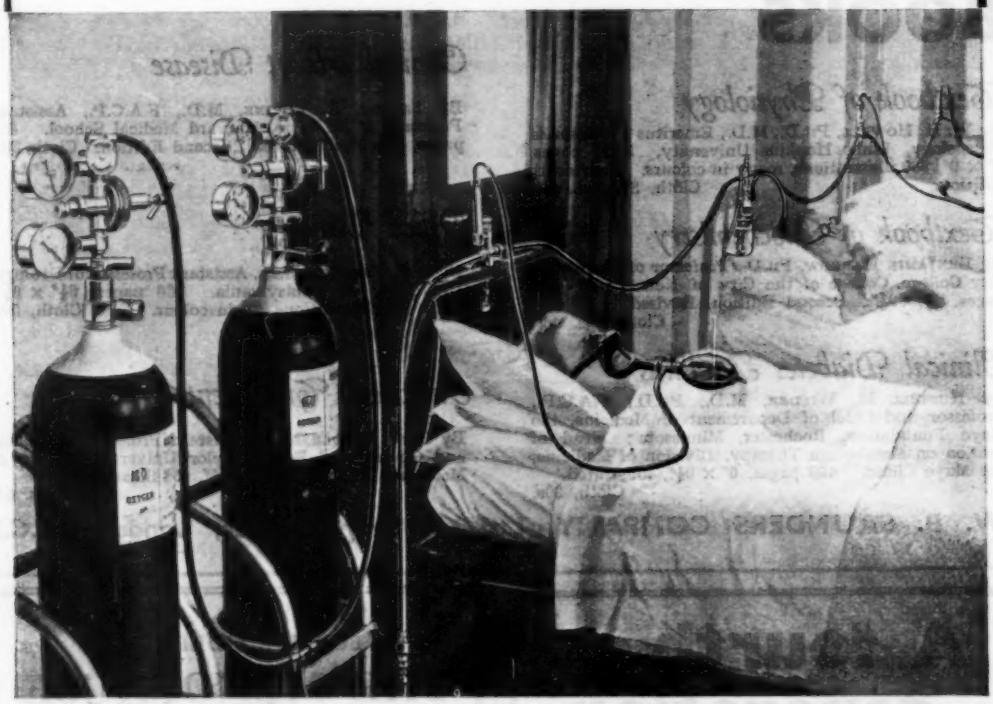
Each tablet contains 0·5 mg. stilbœstrol and 227 mg. calcium phosphate.

Samples on request

MENLEY & JAMES LTD.
123, COLDHARBOUR LANE, LONDON, S.E.5

O:2

GAS CASUALTIES?



SIMPLE AND INEXPENSIVE EMERGENCY EQUIPMENT FOR ADMINISTERING OXYGEN RESUSCITATION TO SEVERAL PATIENTS FROM A SINGLE CYLINDER

With this apparatus, any ward can be converted into an Oxygen Resuscitation Ward in a few minutes, without structural alteration. The apparatus consists of two 100 cubic feet Oxygen cylinders (one 'Running', and one 'Reserve' which automatically cuts in when the first is exhausted), and appropriate number of quick-coupling units, two automatic pressure regulators and tubing.

Assembly is extremely simple. Each control unit is clamped to the bedrail, and its rubber tube is plugged in to the check connecter of the preceding unit. The appropriate flow meter and mask or nasal catheter is attached, and treatment commenced by opening the fine adjustment valve on the control unit. Units can be used independently of one another. There can be no wastage of Oxygen, as the check connecters are fitted with valves which allow the gas to flow only while the unit next astern is plugged in.

This apparatus is not only inexpensive to buy, and costs nothing to install but saves on the price of oxygen, which costs less per cubic foot in 100 cubic feet cylinders than in smaller ones.

The British Oxygen Company Limited's Technical Representatives will be glad to call on any Hospital with full details and prices.

THE BRITISH OXYGEN COMPANY LIMITED

MEDICAL SECTION

WEMBLEY

Incorporating COXETER & SON LTD A. CHARLES KING LTD.

RECOMMENDED BY DIETITIANS AS A GOOD DIGESTIVE AND SOURCE OF ENERGY

MACVITA

A crisp and nourishing product of English Wheat!

MADE ONLY BY McVITIE AND PRICE

For That Extra Margin of Safety—

The ALL KBB BRITISH

SHADOWLESS LAMP

WITHOUT WHICH NO OPERATING THEATRE IS FULLY EQUIPPED

Provides an intense, shadowless, cool and diffused light, allowing the surgeon to see clearly and distinctly throughout the operation. Can be adjusted by a touch. Special Safety Suspensions. Easy to instal. Low maintenance. No glass mirrors to break or require adjustment. Outer glass of non-splinterable safety type.

Installed by most leading Hospitals, Infirmaries and Institutions throughout the country, including those of the LONDON COUNTY COUNCIL.

WRITE FOR DESCRIPTIVE ILLUSTRATED LEAFLET

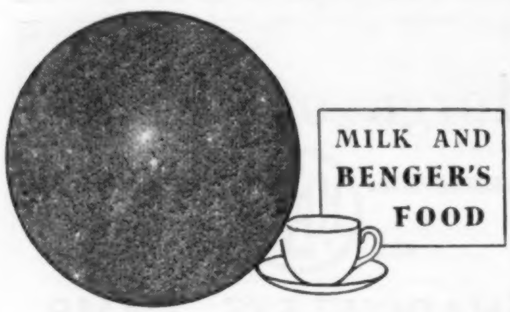
KELVIN, BOTTOMLEY & BAIRD
LIMITED

ILLUSTRATING

the Breakdown of Milk Protein

by Benger's Food

Milk, as soon as it comes in contact with the gastric juice, forms heavy curds. Many children and adults cannot properly digest these curds, and they cause pain and discomfort to persons with impaired digestion. For this reason many who most need milk are denied its great benefits.



As soon as hot milk is poured on to Benger's Food the active pancreatic enzymes, held dormant in its wheaten base become active. Within a very short period — less time than it takes the milk and Food to become cool enough to drink — the milk protein is modified so that only very finely divided curds can form upon contact with the gastric juice. At the same time the starch in the wheaten base of Benger's Food has been rendered soluble with the formation of dextrins, dextri-maltoses and maltose. By virtue of these active digestive enzymes Benger's Food, prepared with fresh milk, forms in the stomach finely divided flocculi, which present a huge surface area for digestion.

Sole Manufacturers: BENGER'S FOOD, Ltd., Holmes Chapel, Cheshire, Eng.

The Benger Laboratories are always at the disposal of the medical profession in any of their dietetic problems.

COME TO MAW'S

FOR ALL YOUR MEDICAL AND SURGICAL REQUIREMENTS!

Maw's are actual manufacturers of many of the lines they sell and have a world-wide reputation for fine quality and reliability

DISPENSARY EQUIPMENT AND APPARATUS

SURGICAL AND MEDICAL SUNDRIES OF EVERY KIND

SURGICAL DRESSINGS

SURGICAL APPLIANCES

BELTS, TRUSSES AND ELASTIC HOSIERY

S. MAW, SON & SONS, LTD.

ALDERSGATE HOUSE, NEW BARNET, HERTS

Telephone: Barnet 5555

Calcium and Phosphorus

in the correct physiological ratio

A great amount of ill-health and poor physique can be attributed to insufficient intake of calcium and phosphorus. Much of this could be prevented by the administration of 'Calfos,' which, being derived from organic sources, presents calcium and phosphorus in the most assimilable form and in the correct physiological ratio.

The appropriate use of 'Calfos' ensures the retention of these two essential minerals in the body in adequate amounts to replace natural losses. It thus marks a noteworthy advance in nutritional therapy of importance to all who suffer—whether overtly or not—from calcium and phosphorus deficiency.

'CALFOS' Brand TABLETS

Samples and full literature on request

CALFOS LIMITED, 65, YALDING ROAD, GRANGE ROAD, LONDON, S.E.16

S2

PROTEIN THERAPY

in

ALLERGIC DISORDERS

ASTHMA, HAY FEVER, &c.

The advantages of specific protein therapy over the more usually practised non-specific treatment has become increasingly recognised as the treatment of choice in such Allergic Disorders as Hay Fever, Asthma, Migraine, etc. Allergic Diagnostic Test Solutions—Duncan are issued in single or multiple group tests. The outfit illustrated contains a 2 cc. bottle of each Multiple Test and is found to be invaluable to the hospital consultant and general practitioner alike, providing him with a comprehensive, reliable testing outfit for Allergic Disorders.

PRICE AND LITERATURE ON APPLICATION

Duncan, Flockhart & Co.

EDINBURGH & LONDON

7

MANDECAL

(Compound Calcium Mandelate B.D.H.)

In Urinary Infections

The administration of Mandecal is not followed by any of the gastric and general reactions which are frequently produced by the sulphonamides ; it is of particular value, therefore, for the treatment of hypersensitive patients and during pregnancy when the patient may already be nauseated.

Mandecal is a pleasantly-flavoured powder which mixes readily with water to form a smooth, palatable suspension, readily taken by even the most fastidious patients.

Literature on request

THE BRITISH DRUG HOUSES LTD.
LONDON N.1

Mncl/E/2s

CLINICAL REPORTS WILL BE FURNISHED ON REQUEST

Prostatic Hypertrophy

In this condition the adequate administration of this Company's **preparations of the prostate gland,** either desiccated in capsules ("Opocaps") for oral administration, or in solution in ampoules ("Opojex") for hypodermic injection, continues to give excellent results.

In conditions of frequency of micturition, retention, incontinence and dysuria these preparations are reported to have proved so efficacious that surgical interference has been avoided in most cases.

"Opocaps" and "Opojex" Prostatic are also of great value in the physical and mental disturbances following prostatectomy.

℞ **"OPOCAPS" (No. 21) PROSTATIC (B.O.C.) gr. 3** (Oral)
Mitte - sig. 1 t.d.s., a.c. (Supplied in boxes of 50 or 100.)

℞ **"OPOJEX" (No. 73) PROSTATIC (B.O.C.)** (for injection)
Mitte - sig. 1 in die (or dieb. alt. when given concurrently with "Opocaps")
(Supplied in boxes of 6 ampoules 2 cc.)

BRITISH ORGANOTHERAPY CO. LTD.

22 GOLDEN SQUARE, LONDON, W.1

Telephone : GERrard 7111 Telegrams : "Lymphoid, London"

Agents in India : SMITH, STANISTREET & CO. LTD., CALCUTTA

Trade **Pentide** Mark

Sodium Pentose Nucleotides

For the treatment of Agranulocytosis

During recent years considerable attention has been given to agranulocytosis, granulopenia, or malignant neutropenia—absence or diminution in number of granular (polymorphonuclear) leucocytes. Two types of this condition are known, namely, true agranulocytic angina, of unknown ætiology, and malignant neutropenia secondary to an obvious cause. True agranulocytic angina is usually acute, characterized by ulceration in the mouth and pharynx, and fatal. Secondary granulopenia includes cases resulting from typhoid fever, some exanthemata, local infection, poisoning by benzene, amidopyrine, sulphanilamide, or arsphenamine, irradiation by *x*-rays or radium, aplastic anæmia, splenic diseases, etc.

Pentose nucleotides, intravenously and intramuscularly, in adequate dosage, have proved successful in agranulocytosis. For the treatment of this condition and other disorders in which increased production of polymorphonuclear leucocytes is desirable, Allen & Hanburys Ltd. have prepared a solution of Sodium Pentose Nucleotides which they issue under the name "Pentide," in vials of 10 c.cm. at 5/-, plus purchase tax.

Allen & Hanburys Ltd., London, E. 2

Telephone: Bishopsgate 3201 (12 lines) Telegraphic Address: Greenburys Beth London

summer heat . . . drought . . . flies . . . contaminated food—and the result—**FOOD POISONING!**

KAYLENE

is the true antidote to Bacterial Toxins and Toxalbumins in contaminated food. Its action is rapid and reliable.

Kaylene brand of colloidal kaolin has been shown to adsorb the toxic principles of Shell-Fish poisoning, Potato poisoning and Mushroom poisoning.

—*vide* B.M.J., 1937, **1**, 595.

Sample on request

KAYLENE, LIMITED

Sole Distributors: **ADSORBENTS, LTD.**, WATERLOO ROAD, LONDON, N.W.2

The above illustrations (greatly enlarged), show Pollen Grains which are among the main causes of Hay Fever.

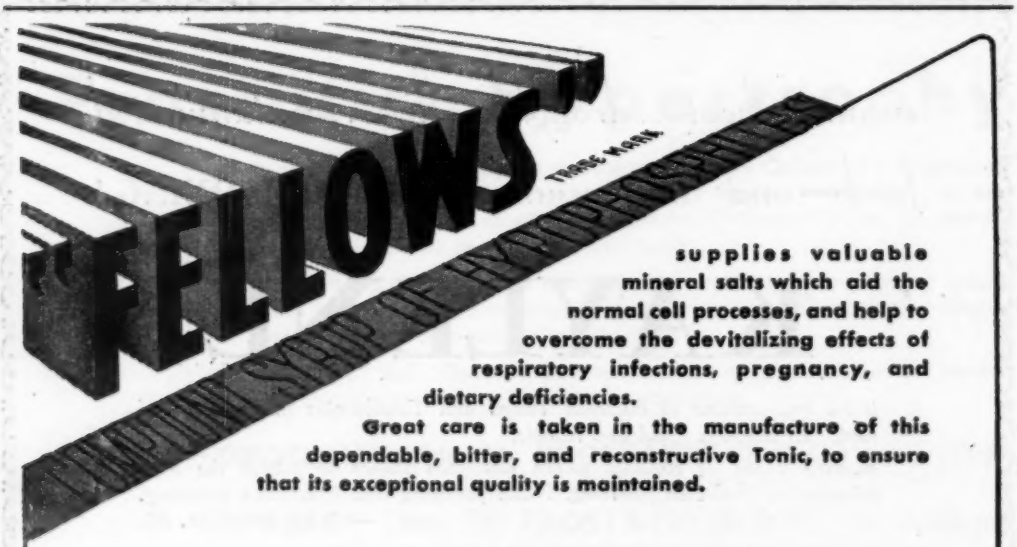
When the POLLEN clouds rise
HAY FEVER AND SUMMER COLDS

During the months of July and August your hay-fever patients will be seeking your advice for relief from the usual nasal congestion, sneezing and other discomforts of hay fever.
Prompt relief for such cases can be obtained by the use of 'Endrine,' which ensures comfortable breathing and has a bland, soothing effect on the inflamed nasal mucous membrane.

Samples on request

'ENDRINE'
BRAND REGD.
NASAL COMPOUND

JOHN WYETH & BROTHER LTD. 25, OLDHILL PLACE, LONDON, N.16.
(Sole distributors for Petrolagar Laboratories Ltd.)



supplies valuable mineral salts which aid the normal cell processes, and help to overcome the devitalizing effects of respiratory infections, pregnancy, and dietary deficiencies.

Great care is taken in the manufacture of this dependable, bitter, and reconstructive Tonic, to ensure that its exceptional quality is maintained.

Samples on Request

Fellows Medical Mfg. Co., Ltd.
286 St. Paul Street, West Montreal, Canada

"ALOCOL"

Colloidal Hydroxide of Aluminium

Rational Antacid Therapy

APART from those cases due to actual organic disease, the treatment of the syndrome of symptoms known as indigestion generally resolves itself into an attempt to overcome hypersecretion of acid and to soothe the irritated or inflamed gastric mucosa.

That "Alocol" possesses intrinsic qualities which render it particularly valuable as a gastric sedative and antacid is now well established. Its freedom from the constipating effect of bismuth, the laxative action of magnesium salts and the gas-forming properties of sodium bicarbonate is especially noteworthy.

"Alocol" forms with the gastric contents a colloidal jelly which has the power of adsorbing free hydrochloric acid. Its markedly soothing effect on the gastric mucosa promptly relieves pain and discomfort. It does not interfere with the normal process of digestion and is free from the danger of "alkalosis."

Complete chemical history of "Alocol," with convincing clinical reports and supply for trial, sent free to physicians on request.

A. WANDER, LTD., Manufacturing Chemists,
184, Queen's Gate, London, S.W.7.
Works and Laboratories:
KING'S LANGLEY, HERTFORDSHIRE.

Indian Sarasvati playing the Vina. (12th Century)

M256

B.D.H. ANÆSTHETICS

ÆTHER PURISS. B.D.H.

The most useful of all general anæsthetics is still probably ether, used alone or with nitrous oxide and carbon dioxide. Satisfactory anæsthesia is readily obtainable, and after-effects are reduced to a minimum if pure ether is employed.

Æther Puriss. B.D.H. satisfies the most stringent standards of purity at the time of issue, and the packing is such that decomposition during storage for a reasonable period is so slight as to be virtually indetectable.

BROMETHOL B.D.H.

For young, nervous or apprehensive patients, basal anæsthesia, using Bromethol B.D.H., is ideal, and for pulmonary, cervical or nasal operations its advantages are obvious.

Bromethol B.D.H. has been shown by clinical trial to be entirely satisfactory for the production of anæsthesia and to be indistinguishable chemically and pharmacologically from the product formerly imported from Germany.

Other B.D.H. Anæsthetics include Chloroform Puriss. B.D.H. and Ethyl Chloride B.D.H.

Literature on request

THE BRITISH DRUG HOUSES LTD. LONDON N.1

Telephone: Clerkenwell 3000 Telegrams: Tetradome Telex London

ÆP/Brml/E/1

TRIVALIN

THE FINEST ANODYNE

In ampoules for injection, capsules and Tablets

Supplied solely to the Medical Profession

Extracts from Clinical Reports:

Cancer. "I have used Trivalin with most satisfactory results in Carcinoma of the Mamma. No preparation I have tried, including Morphia (which produced vomiting) gave so much relief."

"I consider the addition of Hyoscine valuable in Morphia suppression, and have found the combination valuable in hysterical frenzies and other forms of mental excitement."

"I shall continue to use it when Morphia is indicated, and particularly when Morphia-action is indicated but Morphia itself contra-indicated."

LITERATURE AND PRICE LIST ON REQUEST

THE SACCHARIN CORPORATION, LTD.

Telephone: Wanstead 3287. (*Pharmaceutical Dept.*) Telegrams: "Sacarino, Rath, London."

84, MALFORD GROVE, SNARESBROOK, LONDON, E.18

Australian Agents: J. L. BROWN & CO., 123, William Street, Melbourne, C.1.

When mou'd you find your selfe to Natures Needs,
forbeare them not, for that much danger breeds

Some of the very sensible dietetic and hygienic precepts of Regimen Sanitatis Salernitanum have not lost their force across the chasm of centuries that separates modern medicine from the tenets of Galenism. Constipation, then as now, was a universal affliction. Its prevention was the aim of medicine. Irregularity and neglect were then a rule as they are today.

The effective answer of modern therapeutic research to the problem of constipation is Agarol brand Compound — the original mineral oil and agar-agar emulsion with phenolphthalein. It effectively meets the requirements of a gentle yet dependable evacuant in the relief of acute constipation and the treatment of habitual stasis, in young or old, under every condition where a bowel evacuant is indicated.

Agarol softens the intestinal contents and gently stimulates the peristaltic action, making evacuation easy and tending to re-establish normal function.

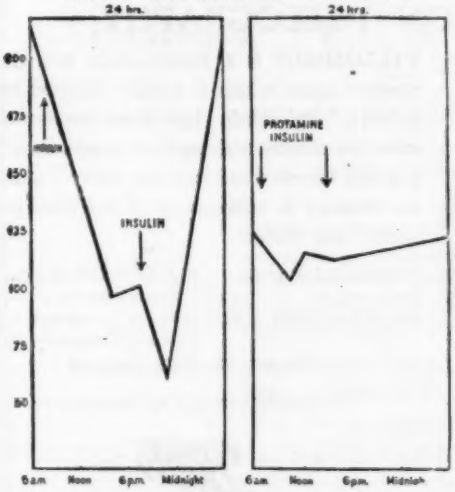
William R. Warner & Co. Ltd., Power Road, Chiswick, London, W.4

AGAROL for constipation

'A.B.' BRAND PROTAMINE INSULIN

(with zinc) **SUSPENSION**

Effect of Insulin without and with Protamine



The absorption of insulin injected in the form of 'A.B.' Brand Protamine Insulin (with Zinc) Suspension is much prolonged and closely resembles the natural secretion of the pancreatic islets. This insulin has a steady action and exerts a better control than that of ordinary insulin over the carbohydrate metabolism. The number of injections can be reduced, a lower total dosage is usually necessary, and the subjective symptoms of diabetes markedly improve.

40 units per c.cm.
5 c.cm. (200 units) 2/10
10 c.cm. (400 units) 5/2

80 units per c.cm.
5 c.cm. (400 units) 5/2

INSULIN 'A.B.' was the first British insulin offered commercially to the medical profession, and has a world-wide reputation for its strictly safeguarded sterility, its carefully standardised strength, its freedom from toxic reactions and its stability in hot climates.

Joint Licensees and Manufacturers:
ALLEN & HANBURYS LTD.
THE BRITISH DRUG HOUSES LTD.

Trade Mark **PHRENAZOL** Brand

Pentamethylenetetrazol

Cardiac and Respiratory Stimulant

Phrenazol has proved to be one of the most potent cardiac and respiratory stimulants which acts through the nervous control of the heart and circulation. It is especially indicated in the treatment of shock and collapse due to over-exertion and other causes and may be used in conjunction with digitalis or strophanthin. The average dosage is 1 c.c. orally or by injection.

Phrenazol is also used for the shock (convulsive) treatment of schizophrenia and for the treatment of barbiturate poisoning and anaesthetic narcosis.

Phrenazol is supplied in 1 c.c., 3 c.c. and 5 c.c. ampoules, boxes of 3 and 6 ampoules; 25 c.c. rubber-capped vials and in powder for preparing sterile solutions. Phrenazol Oral—bottles of ½ fl. oz. and Phrenazol Tablets 0.1 gm., tubes of 10 and bottles of 100.

Obtainable through all Branches of

Boots

Literature sent upon request

BOOTS PURE DRUG CO. LTD NOTTINGHAM

TRADE MARK **PYLUMBRIN** BRAND
DIODONE

FOR EXCRETION PYELOGRAPHY

PYLUMBRIN is a British-made non-irritant contrast agent which is rapidly excreted by the kidneys. Pylumbrin has been submitted to extensive clinical trials and the results show that it is well tolerated and excellent contrast shadows are obtained in radiography of the renal pelvis, ureters, and bladder.

AMPOULES of 20 c.c.		AMPOULES of 3 c.c.	
Single ampoule - -	10/6	Single ampoule - -	2/6
Box of 6 ampoules -	63/-	Box of 3 ampoules -	7/6
		Box of 6 ampoules -	15/-

Discount to the Medical Profession

Obtainable through all branches of

Boots

Literature sent upon request

BOOTS PURE DRUG CO. LTD NOTTINGHAM

BOOTS PURE DRUG CO. LTD 8675-61

Trade **HEWSOL** Mark

A SAFE AND EFFICIENT GERMICIDE FOR ALL PURPOSES

PLEASANT AND ECONOMICAL IN USE

HEWSOL is non-poisonous, but has a high bactericidal value (Rideal-Walker Carbolic Acid Co-efficient : 5·0).

It has no caustic action and its efficacy is much greater than that of the carbolic type of disinfectants in the presence of organic matter.

In pint bottles, ½ gallon Winchester quarts, 1 gallon tins

Free samples to members of the Medical Profession

C. J. HEWLETT & SON, LTD., 35-43, Charlotte Rd., LONDON, E.C.2

B.D.H.

SCARLET FEVER PREPARATIONS

FOR DIAGNOSIS	B.D.H. REAGENT FOR SCHULTZ-CHARLTON TEST
FOR PROPHYLAXIS	For the determination of susceptibility— B.D.H. REAGENTS FOR THE DICK TEST
	For the production of active immunity in susceptible individuals— B.D.H. SCARLET FEVER PROPHYLACTIC: Concentration I, containing 2500 skin test doses per c.c. Concentration II, containing 50,000 skin test doses per c.c.
	For the production of passive immunity in contacts— B.D.H. STREPTOCOCCUS ANTITOXIN SCARLATINA
FOR TREATMENT	B.D.H. STREPTOCOCCUS ANTITOXIN SCARLATINA in a highly concentrated form containing 400 American units per c.c.

Further particulars on request

THE BRITISH DRUG HOUSES LTD. LONDON N.1

Telephone : Clerkenwell 3000 Telegrams : Tetradome Telex London

VS/E/53

ALCOHOLISM AND DRUG ADDICTION

The administration of 'Benzedrine' Brand Tablets almost invariably banishes fatigue and depression and brings about a subjective sense of well-being. The compound has proved highly successful in the treatment of alcoholism and drug addiction, and is justly regarded as "an invaluable aid in combating that physical and mental inertia which is a common factor in all cases of drug addiction when recovering."

British Medical Journal, Nov. 9, 1940, p. 628.

'BENZEDRINE' *Brand* **TABLETS**

Each tablet contains 5 mg. β-aminoisopropyl-benzene sulphate (amphetamine sulphate)

Samples and literature will be sent on the signed request of physicians

Menley & James Ltd., 123, Coldharbour Lane, London, S.E. 5

BT3

TRADE MARK **'MERTHIOLATE'** BRAND

SODIUM ETHYL MERCURI THIOSALICYLATE

'MERTHIOLATE' brand sodium ethyl mercuri thiosalicylate engenders a feeling of security and meticulous discharge of responsibility in the discriminating surgeon as he closes the abdomen or prepares to dress the operative wound in those cases where this antiseptic has been employed.

TINCTURE 'MERTHIOLATE' is an alcohol-acetone-aqueous solution, 1:1,000. Recommended as an effective antiseptic on the intact skin.

SOLUTION 'MERTHIOLATE' is an isotonic aqueous dilution, 1:1,000, which may be used on the most delicate tissues.

Both Tincture 'Merthiolate,' 1:1,000, and Solution 'Merthiolate,' 1:1,000, are available in four-ounce, sixteen-ounce, and one-hundred-twenty-eight-ounce bottles.

ELI LILLY AND COMPANY LIMITED
BASINGSTOKE and LONDON

A FAMOUS NAME IN MEDICINE—

Gale's . . .

For more than a century and a half, products bearing the names Gale and Baiss have been trusted by medical practitioners throughout the world. Now these two famous names are united in the firm of Gale, Baiss & Co., Ltd. To the home trade and to exporters to all parts of the world Gale Baiss supply the finest quality drugs, chemicals, galenicals and concentrated spirituous preparations (in bond, duty free).

Gale's ARE SOLE PROPRIETORS OF

"GOLD MEDAL" Cod Liver Oil Emulsion

"UNG. DERMALON"

"MORELIX"

"HEPTASALINE"

"ENTRAPURO" "GABASOL" "TREXTA"

ETC., ETC.

Gale Baiss also specialise in hospital requirements, surgical and veterinary instruments, druggists' sundries and dressings, packed goods, ampoules, pills and tablets.

No manufacturing chemists have greater experience of preparation and packing for the tropics. Write now for price list.

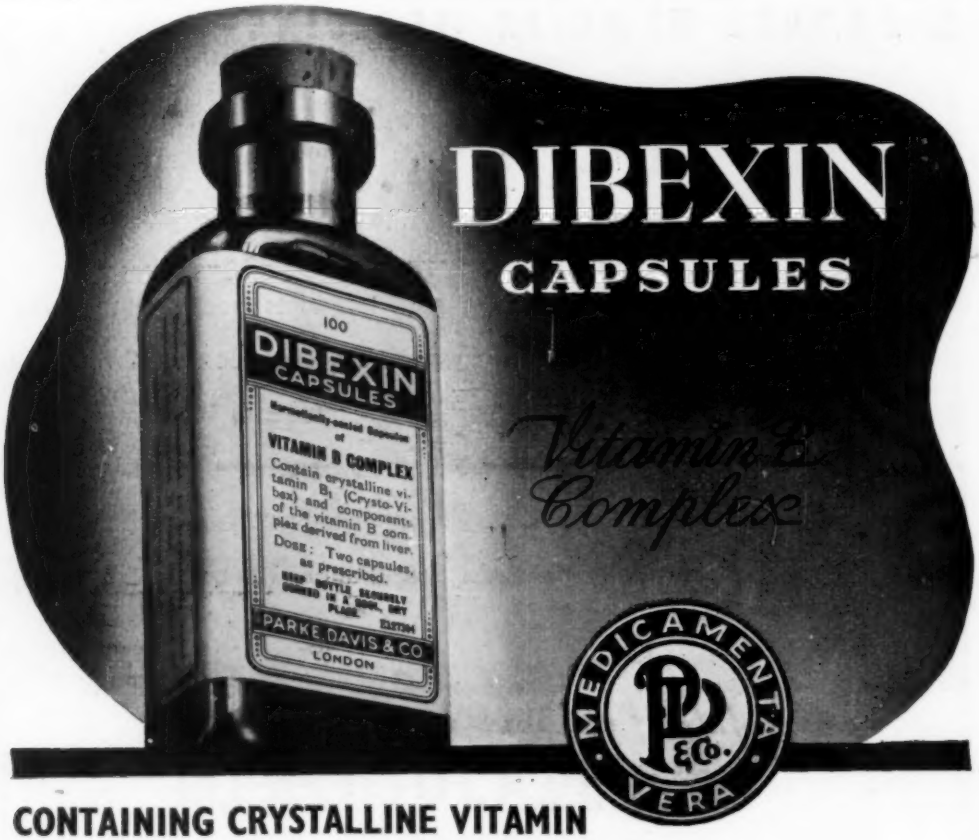
GALE · BAISS & CO · LTD

Wholesale Druggists & Manufacturing Chemists (Contractors to British, Colonial & Foreign Governments

* * ILDERTON ROAD, LONDON, S.E.15. PHONE NEW CROSS 0094 * *

* * * GRAMS & CABLES "DREADNOUGHT LONDON" * * *

17



CONTAINING CRYSTALLINE VITAMIN B_1 AND OTHER COMPONENTS OF THE VITAMIN B COMPLEX.....

Specific vitamin therapy is indicated for the treatment of many known vitamin deficiency diseases, but it is probable that in many deficiency diseases, attributed to loss of some individual factor of the vitamin B complex, there is a simultaneous lack of the complex as a whole. The general vitamin B deficiency that may be expected to exist in conditions where there is interference with the proper intake and utilization of food may be overcome by the administration of Dibexin Capsules.

The requirements of the vitamin B complex are greatly increased for growing children, pregnant and lactating women, during infectious diseases, hyperthyroidism and by an exceptionally high carbohydrate diet.

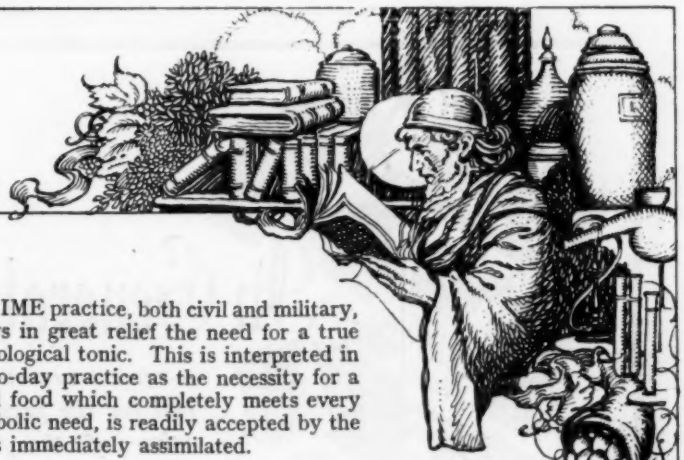
Each Dibexin Capsule contains 1 mgm. of crystalline vitamin B_1 and 40 Sherman units of vitamin B_2, together with nicotinic acid and other recognized components of the vitamin B complex—B_3, B_4, B_5, B_6—derived from liver. Dibexin Capsules are indicated for the prophylaxis or treatment of deficiencies of the vitamin B complex.

Supplied in bottles of 25 and 100 capsules

PARKE, DAVIS & CO., 50 BEAK ST., LONDON, W.1

Laboratories: Hounslow, Middlesex *Inc. U.S.A., Liability Ltd.*

18



WAR-TIME practice, both civil and military, throws in great relief the need for a true physiological tonic. This is interpreted in day-to-day practice as the necessity for a liquid food which completely meets every metabolic need, is readily accepted by the patient and is immediately assimilated.

'Ovaltine' meets this necessity in a highly satisfactory manner both as an emergency measure and as a regular routine. The nutritive and energising constituents of 'Ovaltine' are rapidly assimilated, providing every dietary essential and, at the same time, allaying nervous tension in a most helpful manner.

Now, as in 1914–1918, 'Ovaltine' is widely used in the war-time hospital service both in England and overseas. It is without a rival as a routine dietary supplement designed to meet abnormal demands on the nervous system, while its use at night produces a definite and very desirable sedation.

'Ovaltine' possesses many advantages over ordinary food drinks. It is a concentrate derived from malted barley, full-cream milk and eggs from the world-famous 'Ovaltine' farms, and contains vitamins A, B complex and D, and important mineral elements. Its content of "first-class" protein, carbohydrate and fat is carefully adjusted to the optimal ratio for metabolic needs. Moreover, 'Ovaltine' possesses special properties which make milk more digestible, and thus easily assimilated by even the most acutely ill patient.

Supplies are available to hospitals in special packings and at special prices.

A liberal supply for clinical trial sent free on request

A. WANDER LTD., 184, Queen's Gate, London, S.W.7

Laboratories, Works and Farms: King's Langley, Herts.

Branches: CANADA: Peterborough, Ont. AUSTRALIA: 1, York Street North, Sydney. NEW ZEALAND: Maritime Buildings, Custom House Quay, Wellington. SOUTH AFRICA: P.O. Box 597, Capetown. STRAITS SETTLEMENTS: P.O. Box 660, Singapore. HONG KONG: 18, Pedder Street. Also at Berne, Chicago, Malta, Mauritius, Colombo, Cairo, etc.
Distributing Agents: INDIA: 16, Bank Street, Fort, Bombay.

M302

In General Practice

—cases are encountered daily which call for the prescription of one or other of the following British-made drugs:

★ **DAGENAN—M & B 693** ★
for pneumococcal, gonococcal and meningococcal infections.

★ **SOLUSEPTASINE**
for parenteral administration in streptococcal infections.

★ **SONERYL**
for insomnia.

★ **GARDENAL**
for epilepsy.

★ **MYOCRISIN**
for rheumatoid arthritis.

★ **THEOGARDENAL**
for high blood pressure.

★ **PROSEPTASINE**
for oral administration in streptococcal infections.

★ **SOLUSEPTASINE Ointment**
for topical application in bacterial skin infections.

★ **SONALGIN**
for insomnia associated with pain.

★ **RUTONAL**
for epilepsy.

★ **S.V.C.**
for Trichomonal vaginitis.

★ **CYCLONAL SODIUM**
for intravenous anaesthesia.

★TRADE MARK

M&B

PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LIMITED, DAGENHAM

2473

BROMIDES

in a palatable form

'TABLOID'

THREE BROMIDES

EFFERVESCENT

For patients in need of a light sedative 'TABLOID' THREE BROMIDES, Effervescent, fulfils requirements safely and effectively. The course of treatment can be followed without interfering with the patient's normal routine. The exhilarating sparkling draught produced by dropping these compressed products into a tumbler of water solves the problem of administering bromides in a palatable form. Their precision of dosage is such as is characteristic of all 'TABLOID' Compressed Products.

The combination of the three bromides is considered to be preferable to a single salt for prolonged administration.

'Tabloid' Three Bromides, Effervescent, is prepared to the following formula:

℞ Potassii Bromidi 0.4 gramme (gr. 6-1/4 approx.)
Sodii Bromidi 0.4 gramme (gr. 6-1/4 approx.)
Ammonii Bromidi 0.2 gramme (gr. 3 approx.)
Salis Effervescentis *q.s.*

and is issued in convenient tubes of 25 products at 2/3.

London Price to the Medical Profession, subject to Medical discount. Liable to Purchase Tax.

BURROUGHS WELLCOME & CO.
(THE WELLCOME FOUNDATION LTD.)
LONDON

Associated Houses: NEW YORK MONTREAL SYDNEY CAPE TOWN BOMBAY SHANGHAI BUENOS AIRES

M.4048

21

AN EVANS CASE REPORT

(Case Reference H)

PERNICIOUS ANÆMIA

treated with NEO-HEPATEX

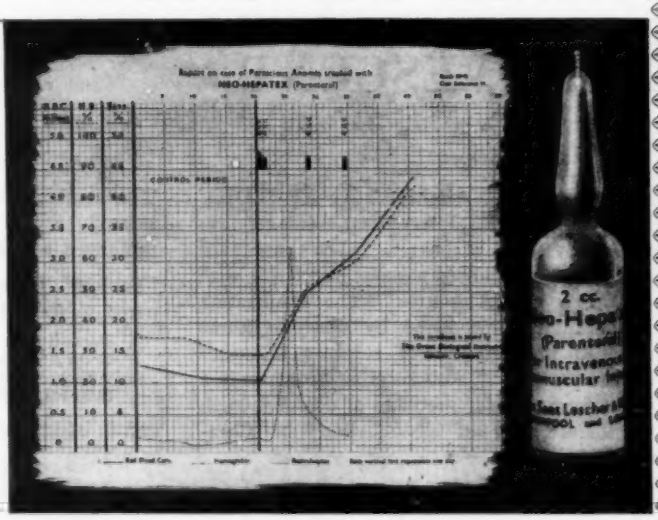
(PARENTERAL)

Neo-Hepatex is issued as follows :

Boxes of Ampoules
- 6 x 1 c.c.
- 50 x 1 c.c.
- 6 x 2 c.c.
- 50 x 2 c.c.
- 3 x 4 c.c.
- 50 x 4 c.c.

Rubber-capped Bottles
- 10 c.c.
- 25 c.c.

Further details and material for clinical trial sent on application to Home Medical Department, Hanover St., Liverpool.



Ample stocks available for immediate delivery

A PRODUCT OF

MEDICAL RESEARCH EVANS

Carried out at The Evans Biological Institute, by

EVANS SONS LESCHER AND WEBB LTD · LIVERPOOL AND LONDON

M.I.R.J

22

ORIGINAL ARTICLES

THE QUANTITATIVE ADMINISTRATION OF ETHER VAPOUR

R. R. MACINTOSH, D.M. OXFD, D.A.
K. MENDELSSOHN, PH.D. BERLIN

Nuffield Department of Anæsthetics, University of Oxford

AN anæsthetic which is in the gaseous state at N.T.P. can be administered in any desired quantity or concentration, by regulating the measured rate of its flow. The object of the work to be described in this and the following papers was to devise means by which the anæsthetist shall be able to control, in a similarly simple and accurate manner, the composition of a mixture containing the vapour of a liquid anæsthetic. The fact that a liquid anæsthetic is stored in the liquid state and administered in the gaseous state confers great advantages of portability and compactness. At the same time, this fact makes the problem of its quantitative administration more difficult because an intermediate process of vaporisation is necessary.

A method of historic interest of administering the vapour of a liquid anæsthetic quantitatively is that of Snow, who in 1849 introduced a measured quantity of liquid chloroform into a large bag, sufficient when the bag was filled with air to form a mixture containing 4% of chloroform vapour. The method proved cumbersome and was abandoned, because, said Snow (1858), "it seemed necessary to sacrifice a little of absolute perfection to convenience." The method was revived for a short time by Clover (1862). More practical methods of administering chloroform dosimetrically were introduced by Vernon Harcourt (1903), Levy (1905), and more recently by Rowling (1932), but for reasons which will be apparent later none of these methods is suitable for ether, of which a much larger volume must be evaporated in order to obtain a corresponding degree of anæsthesia.

In order to explain the present method by which this problem has been dealt with, it is necessary to refer briefly to the physical laws governing the vaporisation of liquids. The concentration of vapour in the atmosphere above the surface of a liquid depends solely on the temperature of the liquid. If the temperature changes the concentration of vapour in the air above the liquid changes accordingly. The vapour-pressure curve for ether (fig. 1) shows the strength of the saturated ether-air mixture corresponding to temperatures ranging between −20° C. and 40° C., expressed both as partial pressure in mm. Hg and in volume per cent. of ether vapour in the mixture. This strength is about 10% at −17° C., 25% at 0° C., 50% at 17° C. (room temperature) and 100% at 34° C., the boiling-point of ether.

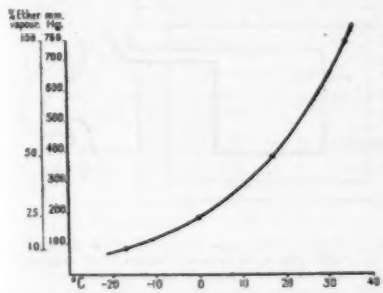


FIG. 1—Vapour-pressure curve for ether.

This gradual variation of the vapour concentration with temperature might seem to offer a means of administering a mixture containing any desired strength of ether vapour simply by changing the temperature of a vessel containing liquid ether, but unfortunately, for practical reasons, the construction of a device which allows such rapid well-controlled changes of temperature is not feasible. We have therefore directed our attention to maintaining in an ether container a constant high concentration of ether vapour, diluting this with air or other gases in such a way that the percentage of ether vapour in the mixture delivered to the patient is known and can be altered at will.

In order to ensure this constant and high concentration of ether vapour it is necessary to keep constant the temperature of the liquid ether within the container. It is here that we meet with our first difficulty. The vaporisation of a liquid is a process which involves consumption of heat—for example, the transformation of 1 gramme of liquid ether into ether vapour of the same temperature requires 90 calories. Unless this "heat of vaporisation" is furnished from outside the liquid will cool, and there will be a continual decrease in the strength of the vapour above the liquid.

The jacket of warm water commonly used round the familiar Boyle's bottle does not provide this heat in a satisfactory manner. If the heat content of such a jacket is to be adequate the size of the jacket will be unwieldy, since the initial temperature of the water must not exceed the boiling-point of ether, 34° C. Further, the temperature of such an assembly will not remain constant, because the temperature of the water will fall as heat is taken from the system.

CRYSTALS AS A HEAT RESERVOIR

The use of an electrical thermostat while theoretically satisfactory is not so in practice, because electricity is not always available, and because of risks of ignition. Instead we have made use of the latent heat of a subsidiary substance to act as a *heat reservoir* at constant temperature. It is well known that if heat is added to or lost from a vessel containing melting ice the temperature of the ice-water mixture does not change. There is an increase in the amount of water present when heat is added, or in the amount of ice when heat is taken away, in each case at the expense of the other phase. Thus any changes in heat content of the system either melt ice or crystallise water, but do not result in changes of temperature. Such a thermostat is well suited to our purpose, but instead of ice we must choose another crystalline substance with a melting-point lying at a more convenient temperature. The maximal concentration of the vapour desired determines the temperature to be maintained within the ether container, and the melting-point of the heat-reservoir substance must correspond with this temperature.

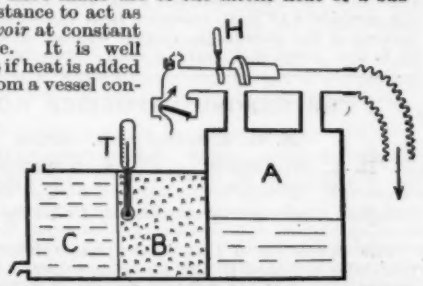


FIG. 2—Scheme of ether vaporiser. A ether container, B heat reservoir containing crystals, C hot-water chamber, H tap for controlling ether concentration, T thermometer.

The general scheme of the new type of ether vaporiser is shown in fig. 2. A is the container in which ether is evaporated, B the heat reservoir containing the crystals, and C is a chamber into which hot water is poured to provide heat to melt the crystals. Let it be assumed that just sufficient hot water has been put into the chamber C to melt all the crystals in the reservoir B. When ether vapour is taken out of the container A, more ether will evaporate in order to restore the original concentration of vapour above the surface of the fluid ether. The temperature of the fluid ether does not fall, because the heat used for the evaporation is furnished from the reservoir B, in which an equivalent amount of molten "reservoir" substance crystallises. This process goes on at constant temperature until all of the liquid in the reservoir B is solidified, which will be shown by a sudden fall in the reading of the thermometer registering the temperature of B. In order to re-melt the crystals hot water is again poured into C. There is no need for the temperature of the water to be below the boiling-point of ether, for the crystals in B will act as a thermal buffer, taking up heat at any higher temperature but releasing it only at the temperature of their melting-point.

Both the vaporisers to be described in the following papers work according to the principle outlined. In the Oxford Vaporiser No. 1 the temperature of the ether is kept *below* its boiling-point by choice of a suitable reservoir substance, and the machine is in fact an ether-vapour inhaler from which a constant supply of highly concentrated ether vapour is available and may be diluted with air to any desired strength by means of a calibrated mixing tap. In the Oxford Vaporiser No. 2, by the use of a reservoir substance whose melting-point is *above* the boiling-point of ether the concentration of ether vapour in the container is maintained at 100%; pure ether vapour is thus available and can be measured and then administered by methods similar to those used with other anæsthetic gases.

The questions with which we have dealt so far are all related to the heat balance which must obtain within the system, and we have so far made the assumption that equilibrium is reached instantaneously. Unfortunately this is not the case in practice. It is well known that it is very difficult to saturate with ether vapour a stream of air passing over an ether surface, and also that it may take a long time before thermal equilibrium is reached between adjacent containers the contents of which are initially at different temperatures. In the construction of vaporisers, therefore, we have not only to ensure that sufficient energy is furnished for the evaporation and that this evaporation takes place at a constant temperature but we must also see that attention is given to the problems of heat transfer, heat insulation, and the mixing of the anæsthetic vapour with air or other gases. It is not possible to give a simple general solution of these problems, so that the way in which they have been dealt with is outlined in the descriptions of the two vaporisers.

SUMMARY

The physical principles involved in the vaporisation of any liquid anæsthetic are discussed. In order to maintain a constant supply of vapour it is necessary to keep constant the temperature of the liquid. Two requirements must be satisfied. First, an amount of heat equal to the latent heat of evaporation of the liquid must be supplied; this is done conveniently by utilising the latent heat of crystallisation of a "reservoir" substance which has previously been melted. Secondly, the heat transfer from the molten reservoir substance to the liquid anæsthetic must be sufficiently rapid. If these are satisfied, a measured amount of the vapour of a liquid anæsthetic can be delivered to a patient just as easily as a measured amount of any anæsthetic which is a gas at room temperature.

The principle of utilising the latent heat of crystallisation has been used for the purpose of maintaining bacteriological specimens at constant temperature by Mislowitzer (1937) and Harrison (1937). We have to thank Colonel L. W. Harrison for his helpful interest in the initial stage of this work.

REFERENCES

Clover, J. T. (1862) *Med. Times Gaz.* **2**, 149.
Harcourt, A. V. (1903) *Brit. med. J.* **2**, Suppl. cxliii.
Harrison, L. W. (1937) *Brit. J. vener. Dis.* **13**, 116.
Levy, A. G. (1905) *Lancet*, **1**, 1413.
Mislowitzer, E. and Burian, H. (1937) *Schweiz. med. Wschr.* **67**, 97.
Rowling, S. T. (1932) *Brit. J. Anæsth.* **9**, 59.
Snow, J. (1858) On Chloroform, London, p. 80.

THE OXFORD VAPORISER NO. 1

H. G. EPSTEIN, PH.D. BERLIN

R. R. MACINTOSH, D.M. OXFD, D.A. — K. MENDELSSOHN, PH.D. BERLIN

Nuffield Department of Anæsthetics, University of Oxford

THE operation of this ether inhaler depends on the principles outlined in the previous paper. A diagrammatical sketch of the apparatus is given in fig. 1. A, B and C contain ether, the reservoir substance and hot water respectively (cf. fig. 2 of the preceding paper). The mask G is placed on the patient's face so that on inspiration air is drawn through the valve V. The air goes straight to the patient (full arrows), or by means of the mixing tap H it can be directed over the surface of the ether (broken arrows). Any concentration of ether-air required for anæsthesia can be attained by setting the tap suitably.

The dimensions of the various chambers are determined by: (1) the amount of ether vapour which is to be furnished in a given time; and (2) the frequency with which it is convenient to supply heat by refilling the apparatus with hot water. In order to fulfil comfortably the maximum demands which may be made upon the machine during induction and maintenance, the vaporisation of 15 fl. oz. of ether per hour has been provided for. The vaporisation of this amount of ether requires 28,000 calories. If we decide that the hot-water chamber is to be refilled once every 60 minutes, then we must be able to add 28,000 calories each time we refill, and this amount of heat will be furnished by 400 c.cm. of boiling water as it cools from 100° C. to 30° C., the melting-point of the reservoir substance. The capacity of the hot-water container is thus determined at 400 c.cm.

Hydrated calcium chloride ($CaCl_2$ 6 H_2O) was chosen as a suitable reservoir substance. Various other inorganic and organic compounds with melting-points in the neighbourhood of 30° C. were tried but rejected because they were too active chemically or were subject to considerable supercooling. The minimum amount of calcium chloride which can be used is that amount which will just be melted completely by the addition of 28,000 calories, since, if less calcium chloride is used, the heat added in filling the hot-water chamber might completely melt the substance and then raise its temperature above the boiling-point of ether. By calculation, this minimum amount of calcium chloride is 700 grammes. In practice, however, it is desirable to use considerably more than this minimum amount. This is a safeguard in case the water container is inadvertently refilled with boiling water twice in rapid succession—although such a mistake can occur only if the reading of the thermometer is ignored. In order to provide a considerable margin of safety we have therefore incorporated a calcium-chloride container with a capacity of 1300 g.

Good heat transfer must be provided between the hot water and the calcium chloride, and between the calcium chloride and the ether; on the other hand, direct transfer of heat between the hot water and the ether must be prevented. These conditions are achieved by arranging the containers concentrically. The hot-water container C is cylindrical and placed centrally; surrounding this is the calcium-chloride container B, and outside this again the ether container A. Since the ether container is maintained at about 30° C., heat loss from the apparatus is small because the temperature difference between its outside wall and the surrounding air is slight. Heat exchange between the containers is increased by making them of an alloy of good heat conductivity, and by equipping the walls with radial fins.

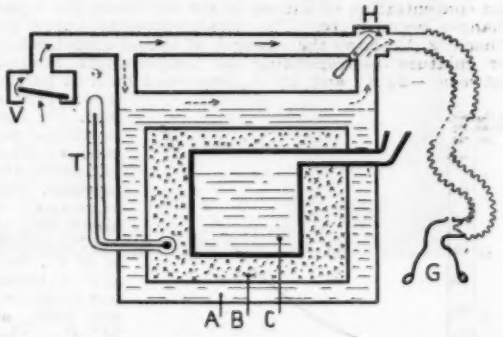


FIG. 1—Diagram of Oxford Vaporiser No. 1 to show general principles. A contains ether, B crystals and C hot water. G mask, H mixing tap, V inlet valve, T thermometer.

DETAILS OF CONSTRUCTION

A modified cross-section through the actual model is given in fig. 2. In order to represent as much as possible in one plane, the layout has been somewhat distorted, and various parts have been simplified—for example,

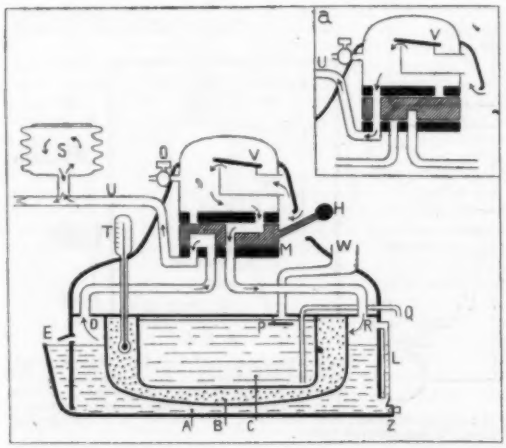


FIG. 2—Modified vertical section through Oxford Vaporiser No. 1. A ether chamber, B heat reservoir containing calcium-chloride crystals, C hot-water chamber, D exit for air plus ether vapour, E ether filler, H lever for controlling ether concentration, L ether level indicator, M mixing-tap assembly, O tap for oxygen, P baffle plate, Q water outlet, R inlet for air, S bag, T thermometer, U tube to mask, V inlet valve, W filler for hot water, Z plug for draining ether. In inset (*a*) the mixing tap is turned so that air passes direct to the patient.

by the omission of fins from the walls of the containers. Fig. 3 is a sketch of the apparatus.

The hot-water chamber (*C*).—Hot water is poured in through the filler W and impinges on the baffle plate P. In this way the freshly added hot water occupies the upper part of the chamber and displaces the cooled water through the outlet tube Q. When the chamber has been completely filled with hot water, the stream flowing from the outlet changes quite suddenly from cold to hot.

The calcium-chloride chamber (*B*) is a cylindrical chamber the bottom of which is rounded so that bubbles cannot be trapped underneath it. It contains the bulb of the thermometer T which registers the temperature of the calcium chloride. After it has been filled this chamber is sealed off by the manufacturers and it should not be opened. The hydrated calcium chloride does not deteriorate with time, but if exposed to air the crystals lose water and become inefficient for our purpose.

The ether container (*A*) is filled through the funnel E, whose upper rim is so arranged that the chamber cannot be overfilled. If by mischance hot water is poured into this filler it would not enter the chamber because of the constriction at the apex of the funnel. The hot ether-water mixture would instead be blown back from the filler with considerable violence. The ether level in A is shown by the level indicator L, and Z is a drain plug through which ether may be drained away.

The inspiratory valve (*V*) *and mixing-tap assembly* (*M*).—When the patient breathes, air is drawn into the vaporiser through the slot in the outer container from which the ether concentration control lever H projects. The air then passes through the inspiratory valve V, whose action can be observed through the transparent dome (D in fig. 3). If required oxygen may be added through the tap O.

The mixing tap consists of three discs in which ports are cut. The upper and lower discs are fixed and the intermediate one can be rotated about a central axis by moving the lever H. By means of the mixing tap the air can now be: (1) diverted wholly or in part over the surface of the ether; or (2) by-passed directly to the patient, who thus receives air only. In fig. 2 the tap is shown in the position in which all of the air reaching the patient passes through the ether chamber, the pathway being marked by small arrows. Inset (a) shows the course taken by the air when it is passed direct to the patient without any part of it passing through the ether chamber. The control handle H can be adjusted to any intermediate position; the figures above it (see fig. 3) indicate the percentage of ether vapour (v/v) reaching the patient.

The spirometer-type bag (*S*) is lightly spring-loaded so that it tends always to remain expanded. In normal use its action is to draw air gently through the vaporiser during the intervals between the patient's inspirations. When the patient inspires, part of the contents is drawn from the bag, but the spring loading cannot produce any resistance to inspiration since air can at all times be drawn freely through the inspiratory valve V. Rebreathing into the bag does not occur because of a one-way valve placed between the mask and the bag. When required the bag can be used as a pump to draw air over the surface of the ether and to deliver the resultant mixture to the patient. This will be found of value during induction, and when an air-tight junction cannot be made between the face and mask, as for example during tonsillectomy. The bag can be used too for artificial respiration; the ether indicator is set at zero, the mask held firmly to the face, and the lungs inflated with air by pressure of the anæsthetist's hand on the bag.

In fig. 3 a portion of the outer wall of the apparatus has been cut away, so that the outer wall of the calcium-chloride container and the radial fins come into view. These fins project almost to the outer wall of the ether chamber, dividing it into twelve separate compartments. Wicks are placed in each compartment. These considerably increase the effective ether surface and since they are applied closely to the wall of the calcium-chloride chamber their temperature does not fall appreciably as evaporation takes place. Slots are cut in the fins to allow the air to pass from the inlet tube (R, fig. 2) to the exit tube (D, fig. 2). The arrangement of the slots is such that the current of air is made turbulent and passes close to the surface of the ether no matter what the ether level may be. In this way, provided the position of the control tap remains unaltered, a constant concentration of ether vapour is delivered to the patient irrespective of the amount of ether in the apparatus.

OPERATION OF THE VAPORISER

The ether chamber is filled. Water, as hot as available, is poured into the water filler W to displace the cold water which escapes from the outlet tube Q. The stream of water emerging from Q is cool at first, but quite suddenly changes to hot. When this occurs no more hot water should be poured in. After a few minutes it will be seen that the mercury in the thermometer T, which for convenience has a horizontal stem (fig. 3), stands above the mark t_1. The apparatus is now ready for use, the concentration of ether vapour delivered from it being determined by the position of the control handle H.

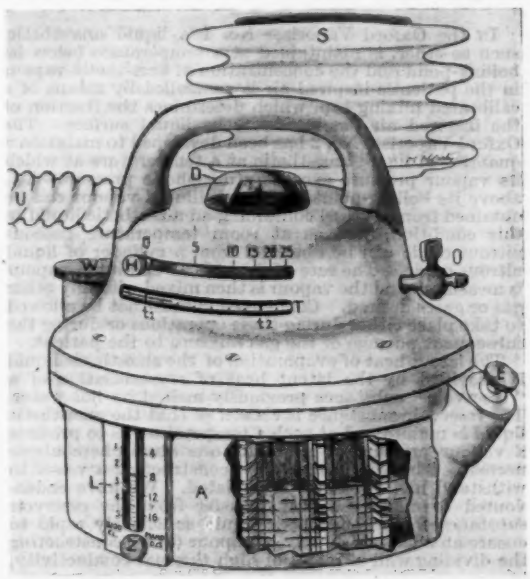


FIG. 3—Sketch of Oxford Vaporiser No. 1 with part of outer wall cut away. For normal working the thermometer reading should be between the marks t_1 and t_2. D glass dome for observing inspiratory valve; other key letters as in fig. 2.

The apparatus requires no further attention until the temperature falls below t_1. This indicates that all the calcium chloride has been solidified and a further filling of hot water is now required. The hotter the water added the less often is it necessary to refill. If by any mistake hot water is added too frequently the mercury in the thermometer may rise above the danger mark t_2. If this happens *cold* water must be poured into W to prevent the ether from boiling.

SUMMARY

In the Oxford Vaporiser No. 1, a liquid anæsthetic, such as ether, is maintained at a constant temperature below its boiling-point, thus making available a constant supply of vapour. The concentration of anæsthetic vapour in the inspired air is controlled by a calibrated mixing tap which determines how much of the inspired air passes through the vaporiser, and how much by-passes it.

The principle of the vaporiser is that hot water is used to melt a crystalline "reservoir" substance, and then this molten substance yields up its latent heat of crystallisation to provide, as required, the latent heat of evaporation of a liquid anæsthetic; the reservoir substance remains at a constant temperature until it has all resumed the crystalline form. For the vaporisation of ether, hydrated calcium chloride, which melts at 29° C., has been found suitable. To maintain the vaporiser in operation it is necessary only to fill at intervals with ether, and with sufficient hot water to re-melt the crystals; cylinders of compressed gas are not required. Since the machine delivers vapour only during inspiration it is economical in use. Artificial ventilation, with or without anæsthetic vapour, can be administered by a spring-loaded bag.

We are indebted to Mr. A. V. Oak, chief engineer of Morris Motors Ltd., and his colleagues for many helpful suggestions, and for redesigning the vaporiser in a form suitable for production in large numbers.

THE OXFORD VAPORISER NO. 2

S. L. COWAN, D.SC. LOND.

R. D. SCOTT, M.B. DUBL. S. F. SUFFOLK, B.SC. LOND.

Nuffield Department of Anæsthetics, University of Oxford

IN the Oxford Vaporiser No. 1 a liquid anæsthetic, such as ether, is maintained at a temperature below its boiling-point and the concentration of anæsthetic vapour in the patient's inspired air is controlled by means of a calibrated mixing tap, which determines the fraction of the inspired air passing over the liquid surface. The Oxford Vaporiser No. 2 has been developed to maintain a quantity of liquid anæsthetic at a temperature at which its vapour pressure exceeds atmospheric pressure—i.e., above its boiling-point.* The undiluted vapour can be obtained from a vessel containing an anæsthetic liquid in this condition, just as at room temperature gaseous nitrous oxide can be obtained from a cylinder of liquid nitrous oxide. The rate of flow of the undiluted vapour is measured, and the vapour is then mixed with any other gas or gases desired. Condensation must not be allowed to take place either during these operations or during the subsequent passage of the gas mixture to the patient.

The latent heat of evaporation of the anæsthetic liquid is provided by the latent heat of crystallisation of a "reservoir" substance previously melted by hot water. The reservoir substance is chosen so that the anæsthetic liquid is maintained at such a temperature as to produce a vapour pressure of less than one atmosphere above normal. Thus the necessity of constructing a vessel to withstand high pressures is obviated. We have endeavoured to make the heat transfer from the reservoir substance to the anæsthetic liquid sufficiently rapid to ensure an adequate supply of vapour (*a*) by constructing the dividing wall of metal of high thermal conductivity, and (*b*) by providing fins of similar metal which pass from one vessel to the other.

* S. R. Wilson and K. B. Pinson (*Lancet*, 1921, **1**, 336) produced an apparatus similar to the one described here in that it consisted of a strong metal vessel which was filled with ether and then immersed in very hot water.

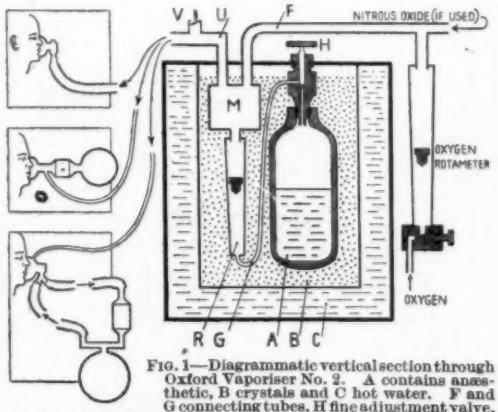


FIG. 1—Diagrammatic vertical section through Oxford Vaporiser No. 2. A contains anæsthetic, B crystals and C hot water. F and G connecting tubes, H fine adjustment valve, M mixing chamber, R flowmeter ("Rotameter"), U connecting tube, V inspiratory valve.

DETAILS OF CONSTRUCTION

The most convenient arrangement of the compartments was found to be in the form of three vessels, one inside the other (fig. 1). The anæsthetic liquid is contained in the inner vessel A, the reservoir substance in the intermediate B, and water in the outer vessel C. The inner vessel is a strong metal cylinder closed at each end, and will hold 12 fl. oz. of anæsthetic liquid. Fins of the same metal are inserted radially (fig. 2). A fine-adjustment needle valve H, situated on the top of the cylinder controls the rate of outflow of the vapour. To prevent condensation the valve is immersed in the reservoir substance so as to leave only the spindle and packing gland uncovered. Although the pressure in the vessel and valve should never reach one atmosphere above normal they are tested to not less than ten atmospheres.

The rate of flow of the vapour is measured by a flowmeter of the rotating bobbin type R ("Rotameter"). To prevent condensation of the vapour, the flowmeter has to be warmed to at least the same temperature as the anæsthetic liquid. Moreover, the temperature of the meter must be maintained constant in order to prevent inaccuracies due to the changes in density and viscosity of the vapour, which would result from fluctuations in temperature. In order to achieve this constant temperature, the flowmeter is surrounded by a metal sleeve of high thermal conductivity and several fins attached to the sleeve pass deep into the reservoir substance. The sleeve is fixed in the outer wall of the reservoir compartment. At this point the water compartment is interrupted, and a window Y cut in the metal sleeve to expose the graduations on the meter and enable the position of the bobbin to be read (figs. 2 and 3). The connecting metal tube G between the needle valve and the bottom of the flowmeter is also kept warm by immersion in the reservoir substance.

After leaving the flowmeter the anæsthetic vapour passes through a short tube to a mixing chamber M, where it mixes with oxygen, or any mixture of gases desired—e.g., oxygen and nitrous oxide. The rate of flow of each gas used is measured by passing it through a rotameter (see fig. 3) before it enters the mixing chamber. This chamber is made of metal of high thermal conductivity and is immersed in the reservoir substance so that mixing takes place at a temperature which prevents condensation of the anæsthetic vapour. Condensation can, however, take place in the tubes connecting the apparatus to the patient unless the precautions discussed below are observed. Both in the tube F leading the oxygen or gas mixture to the mixing chamber and in the tube U leading to the patient a short length of tubing of low thermal conductivity, such as a length of bakelite tubing, is interposed. This greatly reduces the loss of heat by conduction from the reservoir substance to the outer parts of the apparatus.

The vessel for the reservoir substance, like the inner vessel, is made of metal of high thermal conductivity and fins are inserted radially. These pass into the reservoir substance and through into the water contained in the outer vessel (fig. 2). This construction ensures that heat from hot water poured into the outer compartment reaches the reservoir substance as rapidly as possible. A funnel (W in fig. 3) is provided above the water compartment whereby the water is poured in. By an arrangement of tubes this hot water is directed first to the region of the flowmeter, which is thus warmed prior to the remainder of the apparatus, so that risk of condensation of the anæsthetic vapour in the flowmeter is obviated. An outflow for displaced cool water is provided, Q.

At the bottom of the vessel containing the reservoir substance there is a safety device in the form of a fusible metal plug. The metal is chosen to melt at about 10° C. above the melting-point of the reservoir substance. If by accident the water container is refilled too many times so that all the reservoir substance is melted, before the temperature, and therefore the pressure, in the inner vessel can rise appreciably, the metal plug will melt and allow the molten substance to run out.

When the reservoir substance is heated to its melting-point the pressure in the inner vessel rises above atmospheric, and therefore it would be impossible to fill this vessel with anæsthetic liquid without the aid of a pump. A pump P and safety device have been constructed which will deliver anæsthetic liquid to the inner vessel, but no air. This obviates the danger that the pressure in this vessel might be increased unduly by pumping in air; also, it prevents the production, under pressure, of a possibly explosive mixture of anæsthetic vapour and air. The pump is of the hand-operated piston type, the piston being fitted with rings to minimise leakage. It is contained in a small tank filled with the anæsthetic liquid so that any leakage which may occur merely results in the liquid returning to the main bulk. Suitably arranged non-return valves allow the passage of liquid to the inner vessel. In the small tank there is a float which closes the orifice leading to the pump when the level of liquid in the tank falls to within a short distance of this orifice, thus preventing entry of air into the pump. Loss of heat from the warmed part of the apparatus to the pump via the connecting pipe is minimised by interposing a short length of bakelite tubing.

In order that the amount of anæsthetic liquid present in the inner vessel may be ascertained, a liquid-level gauge L is provided. This is recessed into a bakelite block which is mounted in the wall of the middle vessel alongside the metal sheath of the flowmeter.

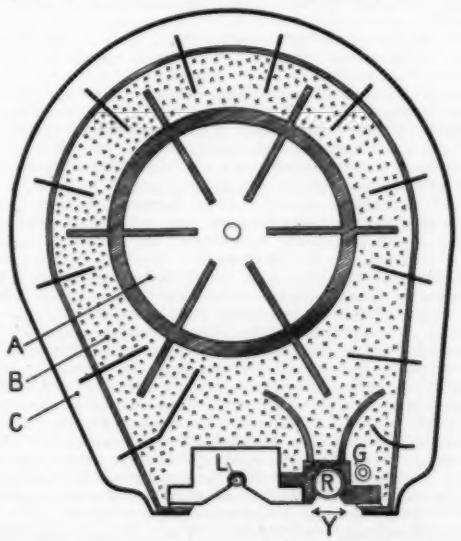


FIG. 2—Horizontal section through Oxford Vaporiser No. 2. A, B, C, G, and R as in fig. 1. L gauge showing level of liquid anæsthetic, Y window in metal sleeve.

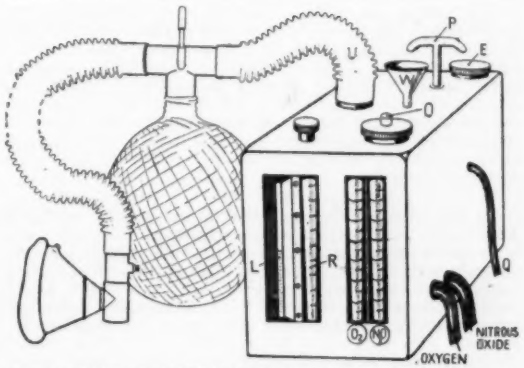


FIG. 3—Sketch of Oxford Vaporiser No. 2. E filler for ether, L fluid anæsthetic gauge, O press-button-actuated emergency oxygen supply, P pump for use when refilling ether chamber, Q outflow for cool water, R flowmeter for anæsthetic vapour, U connecting tube, W funnel for hot water, O_2 and N_2O flowmeters for oxygen and nitrous oxide.

OPERATION OF THE VAPORISER

The method of putting the apparatus into operation can be described conveniently with special reference to ether. When this liquid is used, para-dichlorobenzene has been found a suitable reservoir substance. The melting-point of a moderately pure sample is usually about 52° C. From the data given in International Critical Tables (vol. I, p. 196, 1926; vol. V, p. 130, 1929) it can be calculated that the latent heat of fusion is approximately 43 calories per c.cm. A rotameter graduated in c.cm. of ether vapour per minute, at room temperature, should be fitted into the sheath; also, a fusible metal plug melting at about 62° C. should have been fitted before putting in the reservoir substance. Ether is poured into the tank through aperture E and pumped into the inner vessel until this is full. Three lots of two pints each of hot water (approx. 85° C.) are poured into the water compartment at five-minute intervals. The amounts of reservoir substance and of hot water are chosen so that when enough heat has been stored to vaporise all the ether in the inner vessel there remains enough unmelted reservoir substance to absorb the heat from a further filling with hot water. This provides a reasonable safety margin against filling too frequently with hot water. If, however, this safety margin is exceeded the temperature of the reservoir substance will rise and the fusible plug previously described will operate. While the three amounts of hot water will provide sufficient heat to vaporise all the ether contained in the inner vessel, it is preferable, if more ether is likely to be required, to refill before the supply has become exhausted. To do this the inner vessel is refilled from the tank by operating the pump, and two more fillings of hot water are poured in allowing a five-minute interval.

Provided that the flow of gases (essentially the flow of oxygen) is maintained, mixtures of any desired concentration can be produced by adjusting the control valves to give suitable rates of flow as measured by the respective flowmeters.

To prevent total failure of the supply of any gas the usual precaution in anæsthetic practice of using a pair of cylinders, one always full, is observed. A lightly loaded inspiratory valve V opening to the air is also provided and comes into play only if an insufficient total volume of gas mixture is available to the patient. Should it be desirable at any time to inflate the patient's lungs with oxygen this can be done readily by means of a valve O actuated by a press-button which permits oxygen to pass under pressure to the patient, without passing through the flowmeter.

As the work of Epstein * shows, the temperature of the inspired mixture during its passage from the apparatus to the patient falls to slightly above room temperature. Condensation of ether will not occur in the tube leading to the patient provided that the partial pressure of ether in the mixture does not exceed the vapour pressure of ether at room temperature. As this vapour pressure is

* See the fourth paper in this series.

about half an atmosphere, the ether concentration in the mixture leaving the apparatus must not exceed 50%—that is to say, the reading of the warmed flowmeter must not exceed the sum of the readings of the other meters in use. If the machine is used to vaporise some other anæsthetic liquid instead of ether, the saturation concentration of that vapour at room temperature must be ascertained and a similar "safety ratio" between the readings of the flowmeters must be decided upon and never exceeded.

SUMMARY

In the Oxford Vaporiser No. 2 a quantity of liquid anæsthetic, in a closed vessel, is maintained at a temperature above its boiling-point, so that its vapour pressure exceeds atmospheric pressure. The outflow of undiluted vapour from the vessel is controlled by a valve, and is measured by a flowmeter which is maintained at a constant temperature approximately the same as that of the liquid. The vapour is afterwards mixed in a mixing chamber, also at approximately the same temperature as the liquid, with a measured flow of oxygen, together with any other gas if desired. In this way condensation of vapour is avoided and mixtures containing any desired concentration can be prepared; moreover, condensation will not occur during passage of the mixture from the apparatus to the patient so long as the saturation concentration at the temperature of the coolest part of the connecting tubing is not exceeded. When ether is used at usual room temperatures, condensation will not take place unless the concentration of vapour exceeds 50%; in clinical anæsthesia percentages above 20 are rarely necessary.

The principle of the apparatus is that the anæsthetic liquid, the flowmeter and the mixing chamber are maintained at constant temperature by drawing upon the latent heat of crystallisation of a thermal reservoir substance previously melted by hot water.

THE PERFORMANCES OF THE OXFORD VAPORISERS WITH ETHER

H. G. EPSTEIN, PH.D. BERLIN
E. A. PASK, M.B. CAMB., D.A.

Nuffield Department of Anæsthetics, University of Oxford

THE ability of the Oxford Vaporiser No. 1 to maintain constant any selected concentration of ether vapour has been estimated by analysis of samples of the ether/air mixture taken from its outlet. In fig. 1 the concentration of ether vapour in percentage by volume when the tap of the machine is set to 15, is shown graphically over a period of thirty minutes. (A concentration of 15% v/v of ether vapour in a stream of 6·5 litres per min. corresponds to the evaporation of 1 fl. oz. in 7 min.) During this period air was drawn through the vaporiser by a respiration pump at the rate of 6·5 litres per min. in 25 pulsations of 260 c.cm. each, so that respiration under anæsthesia was simulated. For comparison the output of a Boyle's bottle, with a continuous stream of 6·5 litres of air per min. passing through it, is shown. It will be seen that the output of ether vapour by the vaporiser remains substantially constant, but that that of the Boyle's bottle falls off very sharply. The figure of 15% was chosen for comparative purposes because it is impossible to deliver a concentration greater than this from an un-jacketed Boyle's bottle for more than one or two minutes.

With the Oxford Vaporiser No. 2 it is, of course, possible to maintain a completely constant output of ether vapour; with a given setting of the outflow tap, however, the amount delivered does fall off a little over a period. The change in the flowmeter reading which occurs if the outflow tap is not readjusted is shown graphically in fig. 2. It is clear that a substantially constant output can be maintained by a small adjustment of the flowmeter every few minutes.

In fig. 3 the temperature of the ether mixture as it leaves a Boyle's bottle and the Oxford Vaporisers No. 1 and 2 (the "etherometer") is represented over a period of time by the unbroken lines T 1. The rate of gas-flow through the machines was 6·5 litres per min. in all cases. In the case of the Boyle's bottle the temperature of

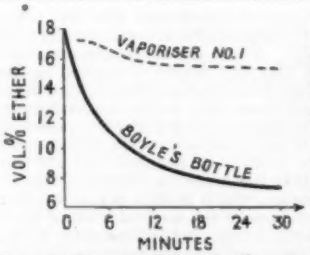


FIG. 1—Concentration of ether in output of Oxford Vaporiser No. 1 set at 15%, compared with that of Boyle's bottle, with 6·5 litres of air per min. passing through each.

the mixture is considerably below room-temperature and in the case of Vaporiser No. 2 considerably above it. The dotted lines T 2 indicate the temperatures of the mixtures by the time they reach the distal end of a corrugated rubber tube, 2·5 cm. in diameter and 90 cm. long, such as is used in anæsthesia for connexion to the face-mask. It will be seen that with all three machines the mixtures as they are delivered to the patient are at approximately room temperature.

CLINICAL PERFORMANCE OF VAPORISER NO. 1

1. *Using ether as the sole anæsthetic.*—Though not recommended if the more usual methods are available, induction with ether vapour is perfectly practicable. The spring reservoir bag is put into circuit, and with the mask held a short distance from the patient's face a gentle current of air containing gradually increasing concentrations of ether vapour is blown over by rhythmic pressure on the bag. The mask is gradually lowered on the face and as soon as the patient becomes unconscious it is applied firmly; the ether concentration is thereafter increased as rapidly as the patient will tolerate it. Surgical anæsthesia is produced usually in about 10 min. In a short series of experimental inductions using ether alone on an open mask, and comparable in comfort and smoothness with those obtained with this vaporiser, it was found that about 30 min. was needed to reach surgical anæsthesia. The extra speed and smoothness of induction with this vaporiser may in part be due to the steady gradual increase in ether concentration which is possible, and it is also probable that the ether vapour at room temperature delivered by the vaporiser is less irritant than the cold vapour from an open mask.

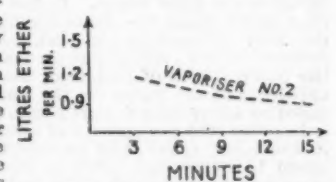


FIG. 2—Output of Oxford Vaporiser No. 2 if outflow tap is not adjusted during administration.

2. *Following induction with ethyl chloride or di-vinyl ether.*—Induction with either of these agents is carried out as usual until automatic respiration denotes the onset of surgical anæsthesia. The mask of the vaporiser is then applied and the mixture control set to 15%. A concentration of this order is now readily accepted and after some minutes the mixture can be enriched or weakened as the requirements of the patient indicate.

3. *Following induction with Pentothal, Evipan, &c.*—The "induction dose" varies between 0·2 and 1 g. according to the robustness of the patient. This dose is given rather quickly, and during the transient respiratory depression which follows the mask of the vaporiser is applied to the face, the spring reservoir bag put into circuit, and an attempt made rhythmically to inflate the lungs with air containing 15% of ether vapour. At first the inspiration of this mixture may be resisted, but if the attempt is continued the patient will shortly accept the vapour and breathe normally. In this way he is rapidly brought under the influence of ether as the effect of the barbiturate wears off. There is, of course, considerable individual variation between patients, but it is found in the majority of cases that percentages of ether vapour greater than 15, used in this way, excite troublesome laryngeal spasm, while percentages below 15 allow the patient to recover from the barbiturate narcosis more rapidly than he is depressed by the ether.

Maintenance of anæsthesia.—When the required plane of anæsthesia is reached the mixture control is brought back to a low percentage, usually between 4 and 6, and the selected plane is then readily maintained

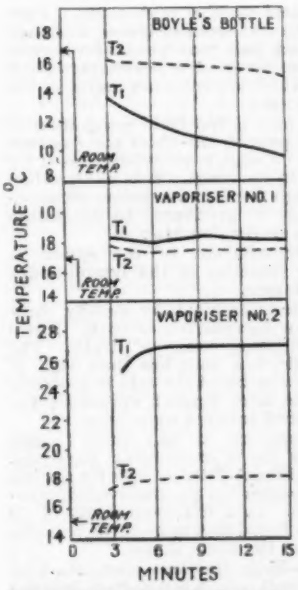


FIG. 3—Temperature of ether mixture on leaving Boyle's bottle and Oxford Vaporisers No. 1 and 2 (T_1), and after passing through 90 cm. of corrugated rubber tubing (T_2).

with great constancy. Provided the mask is firmly applied, and the airway is maintained clear, the patient inspires the percentage of ether vapour indicated by the control lever. If desired, a stream of oxygen can be supplied through the tap provided.

The definite, smooth control which this vaporiser affords allows one anæsthetist, in an emergency, to supervise with confidence the administration of anæsthesia to several patients by less experienced helpers; it also seems to make the administration of *light* ether narcosis easier than with any other method known to us. The vaporiser has also proved satisfactory for the production of analgesia. The low concentrations of ether vapour needed are not unpleasant to breathe and the apparatus has proved of value in obstetrical cases.

Experiments are being carried out to see whether it is worth while incorporating a humidifier in the vaporiser. A saving of the patient's body heat will be effected as the inspired mixture will be saturated with water vapour at almost body temperature. The warm moist vapour will approximate that which obtains during closed-circuit anæsthesia.

CLINICAL PERFORMANCE OF VAPORISER NO. 2

The administration of ether with this machine differs in no significant way from the administration of a gaseous anæsthetic. The ether vapour delivered can be used for induction, or can follow induction by any other agent, and can be combined with any desired gas mixture. The one essential is that a sufficient volume of other gases shall flow into the mixing chamber of the Etherometer to take up all of the ether vapour being delivered, so that the concentration of ether vapour in the final mixture shall not exceed the saturation concentration at room temperature.

* * *

One of the more important advantages of these machines is that they enable clinical observations to be correlated with exact data concerning the amount of ether vapour being administered. Anæsthetists will almost certainly form an entirely new conception of the "strength" of ether as an anæsthetic, and will realise that our present views of the potency of ether are largely conditioned by the methods of administration hitherto available.

SUMMARY

In the Oxford Vaporiser No. 1 the concentration of ether vapour in the inspired mixture is indicated by the position of the tap. The various forms of induction and maintenance of anæsthesia with this vaporiser are discussed. The simplicity of action and control allow an anæsthetist in an emergency to supervise the administration of anæsthesia to several patients by less experienced helpers. The maintenance of ether narcosis of any depth or of analgesia is easy.

In the Oxford Vaporiser No. 2 the vapour of a liquid anæsthetic is measured, mixed with other gases, and delivered to the patient in known concentrations. This vaporiser is essentially one for the experienced anæsthetist.

Both machines make available higher concentrations of ether vapour than are commonly used, and anæsthetists may have to revise their conception of the "strength" of ether as an anæsthetic.

TRICHINIASIS

CLINICAL MANIFESTATIONS AND DIAGNOSIS

PAUL B. BEESON, M.D. McGill

PHYSICIAN TO THE AMERICAN RED CROSS HARVARD FIELD HOSPITAL UNIT, SALISBURY

AUTOPSY examinations in the United States have provided evidence that many thousands of cases occur annually in that country, despite the fact that only a few hundreds are recognised clinically. During the past year there were several outbreaks of the disease in England, where trichiniasis had previously been considered almost non-existent. As a result of clinical, epidemiological and experimental investigations, some previously held concepts require revision. The purpose of the present communication is to review the more significant developments in the knowledge of trichiniasis, particularly in regard to symptomatology and diagnosis.

TRANSMISSION

Trichiniasis results from the eating of meat which contains living larvæ of the nematode, *Trichinella spiralis*. These larvæ are liberated in the gastro-intestinal tract during digestion of the meat. They mature within a few days, and then mate, after which the females discharge new larval forms into the wall of the small intestine. These young larvæ enter the blood-stream and are carried to all parts of the body. Some lodge in the voluntary muscles, where they become encysted and remain alive for many years. Others lodge in the various organs, where they usually die within a few weeks. Illness of the host occurs only during the first few weeks of an infestation; the mere presence of live larvæ in the muscles later does not produce symptoms or signs of disease.

The meat responsible for nearly all cases of human trichiniasis is pork. Different forms of pork are not equally likely to convey infection. Ham and bacon are relatively safe, probably because they are prepared from the meat of young animals and are subjected to some preliminary process of curing, which has an adverse effect on the parasites. Pork sausage and roast pork are the forms most likely to transmit trichiniasis. In the recent epidemics in Britain the source of infection seemed in every case to be pork sausage.

CLINICAL ASPECTS

The symptoms of trichiniasis are often described in terms of the cycle of the parasite, under the headings: intestinal stage, stage of dissemination and stage of encystment. This classification, first employed by Davaine (1863) only three years after the recognition of trichiniasis as a clinical entity, has been followed more or less closely by succeeding writers. But it describes a fixed sequence of symptoms seldom observed in practice. Actually, the proportion of persons who develop symptoms of intestinal irritation is small; and encysted trichinellæ cause no symptoms whatever. An outstanding feature of trichiniasis is its extreme variability, not only in clinical manifestations but also in the severity of the illness as it affects different individuals. The clinical manifestations depend largely on fortuitous deposition of parasites in specific organs, while the severity of the illness is influenced by such factors as the size of the infecting dose and the resistance of the host.

It has become evident that relatively few cases of human infestation are ever recognised clinically. Physicians in the United States rarely make a diagnosis of trichiniasis, although autopsies have revealed that a considerable portion of the population—over 20% in some localities—is infested with the parasite (Sawitz 1938). In England, by means of the skin test with trichinella antigen, I have been able to identify a number of previously unsuspected cases in districts where outbreaks had occurred.* These investigations indicated that the number of unrecognised cases exceeded the number in which a clinical diagnosis has been made.

The disparity is probably due to faulty concepts of the nature of the illness, and to the fact that some infestations do not cause manifest disease in the host. The

* The antigen used in these studies was kindly supplied by the Division of Zoology, National Institute of Health, Washington, D.C.

syndrome usually described as typical—gastro-intestinal symptoms, fever, œdema of the eyelids and muscle pain—is probably encountered only in severe forms of the disease. Field studies indicate that some people who contract trichiniasis remain subjectively normal (Drake, Hawkes and Warren 1935), and that still more have a less severe and less distinctive illness, characterised by such symptoms as malaise, fatigue and backache. Many people under such circumstances do not seek medical advice, and few physicians would suspect trichiniasis as the cause of symptoms so mild and so indefinite. In addition to these milder cases, however, many examples of moderate or severe illness due to trichiniasis go unrecognised by physicians, partly because descriptions in medical textbooks often fail to emphasise significant features of the disease. The following remarks are based on recent personal observations and on study of numerous case-reports.

Incubation period.—In the majority of instances symptoms first appear 7–12 days after ingestion of the parasite, but like all diseases of this class there may be considerable variation. In one American outbreak, traced to a single meal, the onset of symptoms ranged from the third to the twentieth day (Ferenbaugh, Segal and Schulze 1938).

General manifestations.—There is nearly always some rise of body temperature. In most cases this does not exceed 102° F., but in exceptional instances a high sustained fever is present for many days. There may be rigors. The pulse-rate is usually increased in proportion to the fever.

Integument.—Œdema of the orbital tissues (sometimes extending to involve the whole upper portion of the face) is a very frequent manifestation. Chemosis may be present, or there may be much suffusion of the conjunctival blood-vessels. These signs develop during the first week of illness, and seldom persist for more than a few days. Œdema of the extremities may be present, usually being associated with pain and tenderness in the underlying muscle groups. Œdema over the sacrum or of the scrotal tissues is not usual. Skin eruptions are uncommon, although various types of rash have been described: morbilliform, urticarial or nodular. Subungual hæmorrhage, which is especially likely to occur in severe cases, is a striking clinical sign and, almost pathognomonic. The lesions are similar to the "splinter hæmorrhages" of subacute bacterial endocarditis, but are more extensive in trichiniasis, often forming a continuous line beneath the distal end of each finger nail (McNaught 1939).

Cardiovascular system.—Hypotension is common during the febrile stage. According to one case-report the blood-pressure fell to as low as 44/18 mm. Hg (Cheney 1926). Electrocardiographic changes were noted in 6 of 18 patients studied at one hospital (Spink 1935). The changes were; flattening or inversion of the T wave in lead 2, low amplitude of the QRS complex, and evidence of intraventricular block. Pathological examination in fatal cases usually reveals an interstitial myocarditis, and larvæ have been found in the human myocardium, although they do not become encysted there. Cardiac decompensation may be a manifestation of severe trichiniasis, but patients surviving the acute stage apparently have no permanent impairment of cardiac function.

Nervous system.—It has long been appreciated that lesions of the central nervous system may develop in trichiniasis, but the frequency and importance of these has not been stressed sufficiently. When present they often dominate the clinical picture. Sheldon (1941), in a careful study of 76 cases, noted neurological signs in thirteen patients. These included focal pareses and signs of general inflammation, suggestive of meningitis or encephalitis. In conjunction with such signs the cerebrospinal fluid may present no abnormality, or there may be pleocytosis and increased protein content. Kaufman (1940) calls attention to the frequent coexistence of signs of encephalitis and myocarditis. This may be ascribed to the fact that these two conditions are features of heavy infestations, where it is reasonable to assume that many parasites have been deposited in both brain and heart.

Gastro-intestinal system.—Such symptoms as abdominal pain, distension, diarrhœa or constipation occur in less than half the clinical cases of trichiniasis. They usually subside within the first week of illness, although in rare instances abdominal pain may persist for several weeks. Blood or mucus in the stools is not characteristic of trichiniasis; a point which is sometimes useful in the differentiation from dysentery.

Respiratory system.—There is too little recognition of the fact that cough and pain in the chest are frequent symptoms of trichiniasis. Cough is probably caused by the presence of parasites in the lungs. It is non-productive in most cases, although hæmoptysis occurs occasionally. The chest pain may be attributed to infestation of the intercostal muscles or the diaphragm.

Lymphatic system.—Enlargement of the spleen is fairly commonly noted. Swelling of the lymph-nodes has been described, but is rare.

Fatality.—Cases that terminate fatally usually show evidence of myocarditis or encephalitis or both. Pneumonia may be a contributing cause of death. The fatality in recent epidemics has been less than 5%. If subclinical infestations are included the rate is probably less than 1%, and in the later English epidemics the fatality among cases notified was not more than 1%.

Sequelæ.—Complete recovery is the rule, though exceptionally there may be a permanent paralysis. Some muscular pain or stiffness often persists for several months after a severe infection but progressive improvement usually takes place. In a follow-up study of 70 patients, Bercovitz (1940) found that none of the patients had symptoms a year after the acute illness.

Differential diagnosis.—More frequent recognition of clinical trichiniasis will result only when doctors become more alert to the many possible variations of the disease. Trichiniasis taking the form of a febrile illness without localising signs may resemble influenza or typhoid fever. Respiratory symptoms may lead to a diagnosis of bronchitis, pleurisy or pneumonia. Neurological lesions may produce the signs of meningitis, encephalitis or cerebral vascular accident. Gastro-intestinal symptoms may cause confusion with dysentery or food-poisoning. The orbital œdema resembles that of acute nephritis or sinusitis. A practical example of possible errors was cited by Otto and Janney (1937) who reported an episode in which the following clinical diagnoses were made on seven cases of trichiniasis occurring in one family: influenza, mumps, encephalitis, typhoid fever and acute alcoholism.

DIAGNOSTIC PROCEDURES

Demonstration of the parasite.—Although adult trichinellæ are excreted in the fæces during the first few weeks of an infestation, they are not easy to find, and search for them is usually a waste of time. On the other hand, larvæ can sometimes be found in the blood during the first three or four weeks. This means of diagnosis should be used more frequently; the technique is simple and does not require experience. Whole blood is laked by diluting 5 c.cm. with 10 volumes of water. This mixture is centrifuged and the sediment is examined under low power magnification. The size of circulating larvæ is approximately 100 μ by 6 μ; their bodies have a granular appearance. Larvæ have been found in the cerebrospinal fluid, but not in urine. After the third week of illness biopsy of voluntary muscle is a fairly certain means of finding the parasites. They are usually more numerous in certain muscles, such as diaphragm, intercostals and masseters, a circumstance which may be related to the glycogen content of different muscles (Lewis 1928). Because of accessibility the muscles usually chosen for biopsy are the deltoid or gastrocnemius. Approximately 1 gramme of tissue is excised. One portion of it can be examined immediately, pressing the tissue between two glass slides and searching for parasites, using low-power magnification. The remainder can be sectioned and stained in the usual way, and examined for parasites or evidence of myositis.

Eosinophilia.—The differential leucocyte-count is the best guide to early diagnosis. Relative and absolute increase in eosinophils is an almost constant accompaniment of the stage of larval dissemination. If the total leucocyte-count is more than 10,000 per c.mm. of blood an eosinophil count of more than 400 may be interpreted as an eosinophilia. If the total leucocyte count is less than 10,000, a proportion of eosinophils greater than

4% has the same significance. During the first two or three weeks of illness eosinophils usually comprise 15–40% of the total circulating leucocytes. Great variation in the actual percentage is often noted from day to day. Rarely it may be necessary to make more than one examination before the eosinophilia is demonstrated. In people who are moribund or in whom there is a pyogenic complication such as pneumonia there may be a temporary suppression of these cells. In most instances eosinophilia persists for at least 3 months after the beginning of an infestation, and disappears sometime before the end of 12 months.

Immune reactions.—After an infestation with *Trichinella spiralis* specific antibodies are developed by the host. Their presence may be demonstrated by a skin test or by a precipitin test with trichinella antigen (Augustine and Theiler 1932). The antigen employed is a saline suspension of powdered larvæ of the parasite. When good preparations of antigen have been employed a positive skin reaction has been obtained in over 90% of clinical cases (Bozicevich 1938). The reaction is relatively specific; false positive reactions are rare. One feature which detracts somewhat from the value of this test as a diagnostic aid is the fact that a positive response may be exhibited for several years after an infestation; consequently it cannot be interpreted as an indication of recent infestation. In the United States routine skin tests on hospital patients have revealed positive reactions in as many as 10% of persons (McCoy, Miller and Friedlander 1933, Shapiro, Crosby and Sickler 1938). The skin test is of real value when a positive response is obtained in a person who had previously given a negative one, this being almost certain evidence of a recent infestation. Furthermore, a negative response in a subject who has been ill for four weeks or longer is strong evidence against a diagnosis of trichiniasis.

Skin test.—0·1 c.cm. of a 1 in 10,000 dilution of antigen is injected into the skin of the forearm. An equal amount of normal saline is injected 5 cm. distally, as a control. Two types of positive response have been described: delayed and immediate. The delayed type becomes evident after 12–24 hours. It consists of redness and induration, and is similar to a positive tuberculin reaction. This type of response may be elicited as early as the end of the second week of illness, but is usually present only for a few days, after which the response is of the immediate type (Spink 1937). The immediate reaction develops during the third or fourth week of illness, and can be elicited for many months, sometimes for years, after an infestation. This usually consists of wheal and erythema, but in some instances erythema is the only evidence. It appears within 10 minutes of the time of injection, and begins to fade after 15–20 min.

Precipitin test.—This may be employed when the response to an intradermal test has been equivocal. The essential technique consists in adding undiluted blood-serum to an equal volume of antigen diluted 1 : 200 or 1 : 500, and incubating the mixture for an hour at 37° C. The appearance of a precipitate indicates the presence of specific antibody. Precipitins usually develop at about the same stage of the disease as that at which the intradermal reaction becomes positive.

Widal reaction.—The development of agglutinins for *Bacterium typhosum* during the acute stage of trichiniasis has been observed occasionally (Dammin 1941). This possibility must be borne in mind because trichiniasis can simulate typhoid fever clinically. I have recently tested the sera of 15 people who had been ill with trichiniasis 2–4 months previously. There was no significant elevation of agglutinins for either "H" or "O" antigen of *Bact. typhosum* in any of those sera.

X ray of muscle.—There exists a misconception that calcified trichinella cysts can be identified by X-ray examination of muscles. Actually these cysts are so small that they can seldom if ever be distinguished radiologically during life. It is probable that some appearances which in the past have been interpreted as due to trichinella cysts (Gouldesbrough 1918) were in reality *Cysticercus cellulosæ*. Gray (1939) quotes Kirklin in the statement that there is no record of trichiniasis having been recognised radiographically at the Mayo Clinic.

SUMMARY

The clinical features of trichiniasis are discussed, attention being directed to the variability of the disease, both in the nature of its manifestations and in the severity in different individuals.

An eosinophil count is the best guide to early diagnosis. The parasites can sometimes be isolated from the blood during the early weeks of an infestation. They can usually be found in muscle tissue after the third week. The specific skin test and the precipitin reaction with trichinella antigen are useful diagnostic procedures under certain conditions.

REFERENCES

Augustine, D. L. and Theiler, H. (1932) *Parasitology*, **24**, 60.
Bercovitz, Z. (1940) *Amer. J. trop. Med.* **20**, 849.
Bozicevich, J. (1938) *Publ. Hlth Rep., Wash.* **53**, 2130.
Cheney, G. (1926) *J. Amer. med. Ass.* **86**, 1004.
Dammin, G. (1941) *New Engl. J. Med.* **224**, 357.
Davaine, C. (1863) *Gaz. méd. Paris*, **34**, 58, 78, 174.
Drake, E. H. Hawkes, R. S. and Warren, M. (1935) *J. Amer. med. Ass.* **105**, 1340.
Ferenbaugh, T. L., Segal, L., Schulze, H. A. (1938) *Ibid*, **110**, 1434.
Gouldesbrough, C. (1918) *Lancet*, **1**, 468.
Gray, E. D. (1939) Textbook of X-ray Diagnosis, London.
Kaufman, R. E. (1940) *Ann. intern. Med.* **13**, 1431.
Lewis, J. H. (1928) *Zbl. Bakt.* (Abt. 1) **107**, 114.
McCoy, O. R., Miller, J. J., Friedlander, R. D. (1933) *J. Immunol.* **24**, 1.
McNaught, J. B. (1939) *Amer. J. trop. Med.* **19**, 181.
Otto, G. F. and Janney, J. H. jun. (1937) *Amer. J. Hyg.* **25**, 76.
Sawitz, W. (1938) *Publ. Hlth Rep., Wash.* **53**, 365.
Shapiro, M. M., Crosby, B. L. and Sickler, M. M. (1938) *J. Lab. clin. Med.* **23**, 681.
Sheldon, J. H. (1941) *Lancet*, **1**, 203.
Spink, W. W. (1935) *Arch. intern. Med.* **56**, 238.
— (1937) *New Engl. J. Med.* **216**, 5.

BLOOD-PICTURE IN TRICHINIASIS

B. L. DELLA VIDA, M.D. ROME
ASSISTANT PATHOLOGIST

S. C. DYKE, D.M. OXFD, F.R.C.P.
DIRECTOR, PATHOLOGICAL DEPARTMENT

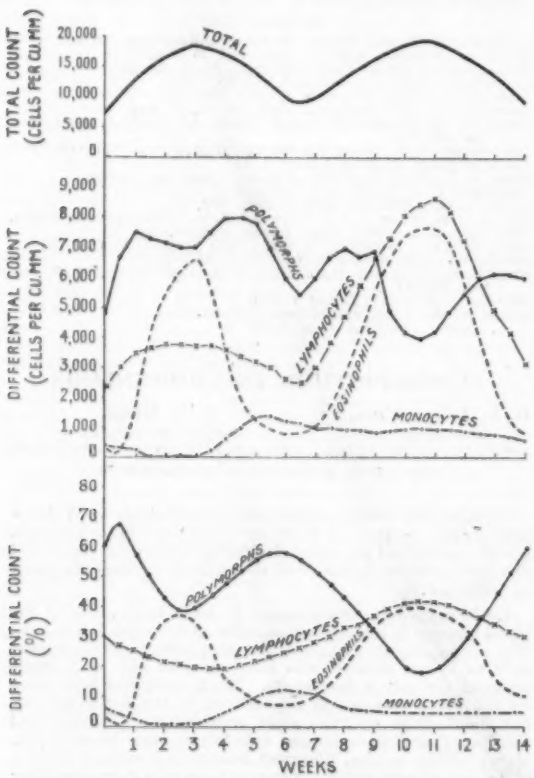
THE ROYAL HOSPITAL, WOLVERHAMPTON

DURING the recent outbreak of trichiniasis in Wolverhampton reported by Sheldon (1941) we have through his kindness had the opportunity of observing the blood changes in about a hundred patients at various stages of the disease.

Little systematic study seems to have been made of the blood changes in human beings suffering from this infestation. The most complete is that of Brown (1898) but this related only to 1 case studied over three months and to 2 others followed for only a few weeks. Much work has been done on the blood changes in infestations in the lower animals but the findings recorded show considerable variation, and their applicability to human infestation must be doubtful. Maass (1933), in pigs, observed leucocytosis and an eosinophilia increasing steadily for twenty to twenty-four days after infestation and followed after a peak lasting one or two days by a steady fall to a normal figure. Wantland (1937), working with rabbits, described a leucocytosis developing in the second week after infestation and an eosinophilia reaching a maximum of 25–79% appearing during the third week and thereafter persisting at a high level for several months. McCoy (1932–33) found no definite eosinophilia in trichinosed monkeys. Van Someren (1938), working with rats, found blood changes developing within four hours of infestation; these consisted of a neutrophilia with concomitant lymphopenia; the proportional distribution of the two types of white cells was fully established within two days from infestation and persisted for a considerable time; total counts of the white cells were not done. The eosinophils decreased in the early stages of infestation; after about three days they began to increase and reached their maximum of 13–20% between seven and sixteen days later; the eosinophilia was found to fluctuate and two or more rises with intervening periods of low eosinophilia were observed; in heavily infested animals there was no increase in the eosinophil percentage, the cells remaining scanty or disappearing altogether; these animals invariably died within two weeks. Beahm and Downs (1939) failed to find any significant eosinophilia in rats after experimental infestation.

Brown in his 3 human subjects found a leucocytosis with absolute and relative increase in the number of eosinophils; the neutrophils showed a fall in total numbers and the lymphocytes a rise. Brown noted the phenomenon, seen in our own cases, of primary and secondary waves of eosinophilia. Three

weeks from the onset of symptoms he found the eosinophilia to attain its first peak, the highest figure recorded being 37%; thereafter it declined to a level of 8–15% at which it stayed for about two weeks; a secondary rise in the eosinophils then began which attained its maximum in about four weeks, the highest figure observed being 68%; from this peak there was a gradual decline in the eosinophil percentage, the last observation—made eighty-five days after the onset of symptoms—giving a figure of 16%. Many observers have reported increase of eosinophils in human trichiniasis, but with the exception of Carter (1930) none seems to have followed the



Composite blood-picture compiled from observations in 100 cases of trichiniasis. Time is taken from the appearance of swelling of the eyelids.

blood changes over any considerable period. Carter observed 2 subjects over two years and in one found the primary and secondary waves of eosinophilia as seen by Brown and ourselves.

In 4 only of our cases was the diagnosis of trichiniasis confirmed by biopsy. We had no antigen for skin-testing, so that in all other cases of the series the diagnosis rested on the blood-picture and clinical appearances. The clinical picture, as pointed out by Sheldon, was clear and unmistakable and there was no doubt as to the correctness of the diagnosis in all the cases included. Some cases were followed for a considerable time and blood examinations made at regular intervals; in others only one examination was made. In all cases full clinical histories were available and it has therefore been possible to construct a composite picture of the blood changes occurring in the human subject throughout the first few months from infestation.

It was not always possible to make a total count of the white cells; our own results however and the study of those of others lead us to believe that the percentage distribution of the white cells in these cases roughly follows variations in total numbers. In epidemics of this sort the majority of the patients are usually seen outside hospital, and only a blood-film is available for examination; diagnosis therefore has to be made on the percentage figures. In examining films, Jenner's stain, which gives good differentiation between the types of cytoplasmic granules, was used. In making differential counts 100 cells were always, and 200 usually examined. For purposes of charting, the day of disease was calculated as from the date of the appearance of the symptom common to all cases—swelling of the eyelids.

ANALYSIS OF RESULTS

A leucocytosis appeared immediately after the appearance of symptoms; this might reach a level of 30,000 white cells per c.mm., but more usual figures were between 12,000 and 15,000 (see figure). The initial leucocytosis persisted for three or four weeks, after which it declined to a more or less normal figure at about the sixth week. Thereafter a second rise in the total number of leucocytes occurred attaining a maximum at about the eleventh week from the appearance of symptoms; this was followed by a slow decline to normal.

The number of the eosinophils closely followed the rise and fall in the white-cell count. In the first three or four days of illness there was no appreciable eosinophilia—in some cases no eosinophils at all could be seen in the films; a similar aneosinophilia was noted by Van Someren in rats. About a week from the onset of symptoms the eosinophil count began to rise, and quickly reached 20%–50% or even more; the highest figure observed in the present series was 71%. After this first peak the eosinophils decreased, both totally and relatively, and at the end of the fourth week reached figures of 5%–15%; at this low level they remained for from three to four weeks after which the secondary rise commenced. The peak of the second wave was attained in about ten weeks from infestation; this was followed by a gradual decline, but a low grade of eosinophilia was still found some months later.

The neutrophils followed a course inverse to that of the eosinophils, their percentage decreasing with the first wave of eosinophilia, increasing as the eosinophilia decreased, and then falling again with the start of the second wave of eosinophilia.

The lymphocytes were diminished or present in normal numbers during the first stage of the infestation; a noticeable increase began at about the fifth week and lasted up to the eleventh or twelfth week, after which there was a decline to a normal figure.

Some authors have stated that the monocytes and basophils show no variations in numbers either relative or absolute in human trichiniasis. Many of our cases during the first few weeks of infestation showed diminution, sometimes resulting in complete disappearance of both types of cells. At the time of the fall of the eosinophils in the fourth to seventh week the monocytes returned to a normal or even higher level. The basophils attained a normal level a little later.

MORPHOLOGY

The morphology of the lymphocytes, monocytes and basophils showed no departure from normal throughout the course of the infestation. The eosinophils were usually of the ordinary type, slightly larger than the neutrophils and showing with Jenner's stain coarse eosinophilic granules. The nuclei were usually bilobed but in some cases many cells with three or more nuclear lobes were noted; in one case a small proportion of eosinophilic metamyelocytes was seen. Many films showed "shadow" eosinophils represented only by a cluster of eosinophil granules liberated from a disrupted cell. The appearance of these seemed to be of no particular significance.

In the later stages of the infestation the neutrophils presented the usual appearance. In the early stages, however, many of them showed in the cytoplasm, along with the typical neutrophilic, a greater or lesser number of eosinophilic granules. This type of cell was observed by Brown in muscle obtained by biopsy from his patients and led him to suggest that the eosinophils found in the blood-stream were actually derived from neutrophils. This conclusion is hardly in accord with present views on the genesis of the white cells; whether it be correct or not it is a fact that in a number of our cases this acidophilic change in the neutrophils showed itself before any excess of true eosinophils appeared in the blood-stream. In several very early cases one of us

(B. L. D. V.) was able with the clinical symptoms in view to make a diagnosis of trichiniasis on the strength of the presence of these acidophil neutrophils; in all the typical eosinophilia appeared later. These acidophilic granules of the neutrophils were somewhat smaller than those of the true eosinophil cells but slightly larger than the neutrophil granules; they varied greatly in number in the cytoplasm of individual cells even in the same film; in some they were scanty, in others so numerous as to make differentiation from a true eosinophil a matter of considerable difficulty.

The absence or paucity of eosinophils in the earliest stages of infestation has been ascribed by various authors to the fixation of the eosinophils present in the blood-stream around the adult worms as they embed themselves in the intestinal mucosa. Later, in response to the toxins liberated by the worms, the bone-marrow secretes and mobilises more of these cells and the percentage in the blood-stream increases. This brings about the first wave of eosinophilia. From the fifth to the seventh week after infestation the larvæ are migrating to and establishing themselves in the striated muscle; again there is a fixation of eosinophils around the encysting worms which accounts for the decline in the eosinophils found from the fifth to the seventh week after infestation and preceding the second and final wave of eosinophilia.

All the cases we saw showed some degree of eosinophilia after the first three days, and all recovered. A persistent absence or low level of eosinophils in the blood-stream is said to be of bad prognostic significance in trichiniasis. Spink (1934), however, observed that animals experimentally infested with trichinella failed to develop an eosinophilia when they had a bacterial infection as well; this finding may also apply to human beings, and if so would have to be taken into account in diagnosis.

SUMMARY

The blood-picture has been followed in about 100 patients suffering from infestation with *Trichinella spiralis*. The following points were observed.

Leucocytosis occurs in a primary wave reaching its peak at about the third week from onset of symptoms and a secondary wave reaching its peak at the eleventh week.

The eosinophils diminish or may disappear within the first three days from onset of symptoms; thereafter they increase in primary and secondary waves coinciding with those of the general leucocytosis.

The neutrophils diminish during the waves of general leucocytosis and increase as the eosinophilia diminishes.

The monocytes increase with the first diminution in the eosinophilia.

In addition to true eosinophil cells, neutrophils bearing within their cytoplasm greater or lesser numbers of eosinophilic (acidophilic) granules may appear, especially in the early stages of infestation.

Our thanks are due to Dr. J. H. Sheldon for access to case-histories.

REFERENCES

Beahm, E. H. and Downs, C. M. (1939) *J. Parasitol.* **25**, 405.
Brown, T. R. (1898) *J. exp. Med.* **3**, 315.
Carter, L. F. (1930) *J. Amer. med. Ass.* **95**, 1420.
Maass, Z. (1933) *Zbl. Bakt.* **129**, 29.
McCoy, O. R. (1932–33) *Proc. Soc. exp., Biol. N.Y.* **30**, 85.
Sheldon, J. H. (1941) *Lancet*, **1**, 203.
Spink, W. W. (1934) *Arch. intern. Med.* **54**, 805.
Van Someren, V. D. (1938) *J. Helminth.* **16**, 83.
Wantland, W. W. (1937) *J. Lab. clin. Med.* **23**, 32.

ELECTRICAL CONVULSION THERAPY

A. M. WYLLIE, M.D. Glasg., D.Psych.

MAJOR, R.A.M.C.; DEPUTY PHYSICIAN SUPERINTENDENT OF CRICHTON ROYAL MENTAL HOSPITAL, DUMFRIES

THE method of producing convulsions by electrical stimulation introduced by Cerletti and Bini in Rome has been used in this country by Shepley and McGregor (1939, 1940), and by Fleming, Golla and Grey Walter (1939, 1940). In this hospital we have used the simple and inexpensive machine devised by Grey Walter. When this is used in a favourable case there is an immediate spasm of the muscles on pressing the shock button. The thighs are flexed on the abdomen, the arms are extended, and the facial muscles produce a grimace. A few seconds later the true tonic spasm sets in, often heralded by a cry and fixed staring eyes, with conjugate deviation to one or other side. The tonic spasm is essentially the same as that induced by Cardiazol, but it is a little shorter in duration and less powerful. The veins of the head and neck stand out prominently, and the skin is red and congested, while the eyelids close spasmodically. The mouth, which is open at the beginning of the tonic stage, closes powerfully and there is a tendency to bite the tongue. Carpopedal spasm follows with hyperextension of the fingers, and the arms are extended while the legs are flexed on the abdomen. Towards the end of the tonic stage the legs are fully extended. "Goose-flesh" is often present. The clonic stage follows and the colour becomes livid. When the clonic jerkings settle down, respiration is spontaneously re-established, there is a short period of hyperpnœa, and the patient quietly returns to consciousness. This description belongs to the majority of cases, but each patient has his own individual reaction. A few of my patients were extremely restless and difficult to control for 5–10 minutes after the fit. In many cases it was necessary gradually to increase the impulse in intensity and duration as the course progressed in order to secure a complete reaction. Treatments are given thrice weekly at first, then twice weekly, according to the patient's progress.

It has been claimed for this treatment that the amnesia is complete and fear of treatment consequently eliminated. In my experience the amnesia is deeper than with cardiazol or triazol, but fear is not eliminated although it is diminished. Most patients who were sufficiently intelligent to express an opinion disliked the treatment; some hated the "going off" and others the "coming round." Nevertheless, appreciating their own rapid improvement, most of them were fully coöperative. One patient who had triazol shortly after a course of electrical shocks referred to electrical therapy as "the nice treatment" and triazol as "the bad treatment." Some of the schizophrenic patients resisted being brought for treatment—partly from general negativism—and so did some resistive melancholic patients. Among the melancholics, however, it was noticeable that resistiveness diminished as the treatment progressed and the patient improved.

The patients recovered quickly from the fit and after a period of confusion lasting 10–30 minutes were able to be up and moving about. Many complained of headache on the evening after treatment and a few vomited. Muscular pains—a constant feature of cardiazol and triazol therapy—were rarely complained of, only three patients being affected in this way. No fractures or dislocations occurred in this series but among patients since treated there was one compression fracture of the spine and one dislocated shoulder.

In nearly all cases amnesia was complete for a period lasting from a few seconds before the impulse till 5–10 minutes afterwards. Even when a major convulsion was not produced amnesia was complete—an important difference from cardiazol and triazol therapy. An ineffective injection of these drugs often causes fear and apprehension and produces resistance to treatment; failure to produce a major convulsion by the electrical method does not in any way prejudice the continuance of the treatment. After an incomplete reaction the patient recovers quickly and can walk away from the treatment couch. Several patients complained of disorder of memory distinct from the amnesia covering the period of the treatment. There was a transient retrograde amnesia of a patchy type and a retention defect; these memory symptoms were more severe than those following cardiazol or triazol therapy.

RESULTS

Twelve cases of involutional melancholia were treated; three recovered and were discharged; two recovered and are convalescent, one of these being a woman of 56 who had been ill for more than 12 months, and the other a woman aged 59 who had been ill for more than 2 years. Six chronic cases showed improvement and another case improved but relapsed. This recovery-rate cannot be fairly compared with the spontaneous recovery-rate,

because the cases treated were selected as being severe and unpromising. Eighteen cases of schizophrenia were treated; only two had been ill for less than a year, of whom one recovered and the other recovered and relapsed and was transferred to the insulin department. Of nine chronic hebephrenic cases six improved and three showed no change. One psychopathic schizophrenic improved in behaviour although there was no essential change in her mental condition. Four chronic catatonics improved in behaviour and became more amenable and sociable. Two chronic paranoid cases improved, but suffered a partial relapse later. Of three patients suffering from manic-depressive psychosis two were melancholic and one manic; one of the melancholic patients, a girl of 24, recovered after six treatments, all of which produced fits, mental improvement being manifest from the first treatment. The other was

RESULTS OF ELECTRICAL CONVULSION THERAPY IN VARIOUS PSYCHOSES

Diagnosis	Patients treated	Feared treatment	Immediate improvement	Improvement maintained for 2 months	Discharged
Schizophrenia					
Hebephrenic ..	10	6	6	1	0
Catatonic ..	5	1	5	0	0
Paranoid ..	3	1	3	1	1
Manic-depressive psychosis					
Mania	1	0	1	1	1
Melancholia ..	2	0	2	2	1
Involutional melancholia	12	8	12	11	5
Senile melancholia ..	2	1	2	1	1
Psychoneurosis ..	1	0	1	0	0
Total	36	17	32	17	9

a woman of 28 who showed only slight improvement after each effective treatment; she had a high threshold and only three out of eight treatments were effective in producing major convulsions; triazol was substituted with immediate success in bringing about recovery. In one case of long-standing involutional melancholia (17 years' duration) in a woman of 64, and in two cases of senile melancholia in women of 65 and 67, the patients were restored to a condition in which they could enjoy their lives and take an interest in affairs. A woman of 34 suffering from a severe psychoneurosis with suicidal and hysterical tendencies recovered and relapsed, and is still under treatment. The table summarises the results.

DISCUSSION

Electrical therapy, besides producing less fear than cardiazol or triazol, has other advantages over them. The spasm is not so severe—hence fractures, dislocations and muscular pains are less common. A second fit rarely follows the first and hence there is no risk of the patient passing into status epilepticus, though one of my patients (treated recently and not included in the series) had a second seizure an hour after the first. Long courses of injections of cardiazol or triazol may damage the vital organs such as the kidneys and heart, but there seems to be no objection to giving short electrical courses of three or four treatments twice, thrice or four times yearly to patients who recover or partially recover and then drift back again. In this way many patients can be maintained at an improved mental level. Nor does administration of electrical treatment depend on the existence of suitable veins. Finally, if electrical treatment fails to produce a major convulsion the patient is not upset or resistive to further treatment, as often happens after an ineffective injection of cardiazol.

The amnesia for the actual treatment is complete, so it is desirable that the patient should be maintained in ignorance of what happens while he is unconscious. Such words as "fit," "convulsion," "electrical shock" are best avoided in the patient's presence. "Electrical treatment" would lead to confusion with ultraviolet therapy. We have, therefore, referred to the treatment as "Cerletti's treatment."

The retrograde amnesia is more severe than that which follows cardiazol therapy and is associated in some cases with disorder of retention. The cases which I have so far studied have recovered their memory after a few weeks, which suggests that the memory disorder implies no permanent damage to the mental powers. The question merits further observation.

I have to thank Dr. P. K. McCowan, physician superintendent of Crichton Royal Hospital, Dumfries; Mr. Grey Walter; and Dr. W. Mayer-Gross.

REFERENCES

Fleming, G. W. T. H., Golla, F. L., Walter, W. G. (1939) *Lancet*, **2**, 1353.
— — — (1940) *Proc. R. Soc. Med.* **33**, 261.
Shepley, W. H. and McGregor, J. S. (1939) *Brit. med. J.* **2**, 1269.
— — (1940) *Proc. R. Soc. Med.* **33**, 267.
Walter, W. G. (1940) *Brit. J. phys. Med.* **3**, 146.

AIR-RAID STRAIN IN MENTAL-HOSPITAL ADMISSIONS

I. ATKIN, M.D. Lond., D.P.M.
ACTING DEPUTY MEDICAL SUPERINTENDENT OF KNOWLE MENTAL HOSPITAL

WHERE ætiological factors are obscure, subtle or uncertain, and knowledge still incomplete, a common error is to attribute the cause of disease to some preceding or coincident event which may be quite irrelevant. Well-known examples are the belief that cancer of the breast is caused by a blow on the chest and that epilepsy results from a fall in childhood. In mental illness such irrelevant causes are given even more often, and lately we have noticed that the routine inquiry forms we send to relatives of patients admitted into mental hospital contain a statement in some form or other that air-raids were the only or a contributory cause of the mental illness. I have therefore analysed 300 consecutive admissions (131 male, 169 female) admitted from September, 1940, to April, 1941.

Air-raids are undoubtedly a disturbing psychological factor in areas which are frequently and severely bombed, and people who are totally indifferent to them must be the exception; many of these repress the natural feeling of fear and run the risk of later developing a neurosis. But to claim air-raids as an important causative factor in mental illness is to do them too much honour.

In 46 of the 300 cases investigated air-raids were suggested as an ætiological factor. This number divided itself into three groups:

1. Cases in which air-raids appeared to be irrelevant (11 male, 25 female).
2. Those in which they were probably partly contributory (3 male, 3 female).
3. Those in which they seemed the major ætiological factor (2 male, 2 female).

The figures are not large but it will be noted that whereas in groups 2 and 3 the percentage of male and female cases are identical, in group 1 there is a higher rate among the females. This is probably because women normally exhibit more readily the external expressions of fear and so give onlookers the impression that they are more upset.

GROUP 1 (36 CASES)

In 20 of the first group there had been either a previous attack or the symptoms were definitely known to have existed before the air-raid phase of the war; in another 8 the condition was a senile psychosis; the remaining 8 were cases of syphilis (2), schizophrenia (4) and melancholia (2). The following two case-histories may be regarded as characteristic, showing on what sort of evidence air-raids were excluded from the ætiology.

CASE 1.—A woman of 43, who had gone to pieces in the last few weeks, could not concentrate, slept badly; air-raids were said to have upset her. She had a history of alcoholism and attempted suicide in 1938. Was an inpatient in 1938–39; was then depressed, agitated, worried, apprehensive, feared people were talking about her; long history of frustrated sexuality elicited. On that occasion left hospital relieved. When admitted this time she was mildly depressed, worried, undecided, and not sleeping well. Admitted she had not been a good sleeper since the age of 16, which was why she took to alcohol at one time.

CASE 2.—A woman of 73. Home wrecked while patient was in it by enemy bombs, about 4½ months ago. Gradual development of irritability, depression, fear of gunfire and other noises. Patient was well for 6 weeks after the bombing incident, then began to wander about in her nightdress. On admission presented the picture of senile dementia. Amnesic, disorientated, confused, aimlessly restless at night. Generally her mood was one of cheerful levity.

GROUP 2 (6 CASES)

It is by no means easy to decide how far the strain may have been causative. The mere fact that the symptomatology is partly descriptive of air-raid experiences is no valid proof, since these may be utilised as symbols of old-standing psychic conflicts. To assert a causal connexion in every such case is as logical as to maintain that horses are a cause of phobia for these animals or that open spaces are the cause of agoraphobia. It is a common and well-known mechanism for anxiety or fear to be displaced from some repressed object or situation to any convenient symbol at hand. There is, however, one variety where air-raids can be regarded as an aggravating factor in a potentially neurotic person—where there has been a fear of death, not always conscious of course. As Stekel has pointed out, such a fear is often based on a fear of punishment in an after life for one's guilt or imagined guilt. War and especially air-raids make us more conscious of death as a proximate possibility; there is a tendency to review one's life, and those already burdened with a sense of guilt (as the neurotic invariably is) may have their fears of death exaggerated. This mechanism is demonstrated in cases 3 and 4 and, though not fully analysed, also in case 5. Before briefly describing these, I would like to quote the case of an outpatient (not in this series) where this mechanism is particularly well shown. This man, aged 45, when a child had it drummed into him that this life is preparatory for a life to come, that he would be judged for his misdeeds on earth. He has had a fear of death ever since he can remember, but nevertheless led a very useful married life until bombs dropped very near his place of employment. He suddenly realised how near death he had been, and developed a state of fear at the thought that he might have been so near judgment and perhaps been condemned to eternal punishment for his sins. These sins were of course exaggerations of trivialities. Analysis is revealing an intense mother fixation and unconscious death wishes directed against his wife.

CASE 3.—A woman of 58. In a low state, after years of semi-starvation due to extremely weak digestion, she found the gun-fire terrifying. She imagined that if she died the Lord would punish her for not having lived a better life. Her brother had died in a mental hospital. She had been treated for stomach trouble for 9–10 years past (X-ray reports negative). Worried by disturbing dreams for years. She looked worried and depressed, occasionally agitated. Self-depreciatory, fearing she would become insane. Said she had been getting depressed with the air-raids, indeed ever since the Dunkirk affair; that lately she has "got into a state of heat" which she connected with auto-erotic practices in the past. Before the war she once got the idea that the Devil was having intercourse with her. She described two "disturbing dreams": (1) as if an evil spirit was in the room, and then something touched her on the spine; (2) she was lying on the floor and protecting herself with the cross from a leering evil spirit, defending her honour. She was afraid she would die, afraid of the day of judgment. She is a case of late climacteric melancholia (periods ceased 8 years ago) and the idea of a nearer possibility of death accentuated her fears of being severely judged for her sins.

CASE 4.—A man of 43. Had been looking after an invalid aunt for the past 4 years. "What with that and the air-raids, it upset him." He had an alcoholic heredity. Complained of lack of concentration, indecision, fear of the future, erratic memory, depression. He felt he could not rise to the occasion, the gunfire upset him; he was terrified generally. Much material was obtained under Evipan hypnosis. He identified himself with the uncle but felt that he had failed in replacing him. Air-raids accentuated his fear of death because he felt he had not conducted himself on this earth as he should have done and was afraid of punishment. There was an ambivalent attitude to his aunt with a suggestion of repressed death wishes against her, and this strongly contributed to his sense of guilt.

CASE 5.—A woman of 37. Child born a month before admission; forced to live apart from husband. The noise of the guns troubled her. She was agitated and experienced difficulty in expressing herself. She said that she couldn't stop thinking, her mind felt so small, she couldn't relax, she hadn't slept for months, she wanted to do everything at once. She was unable to give much account of herself, merely repeating the same phrases again and again. She was given 5 c.cm. sodium evipan intravenously. After 5 minutes' sleep, when still rather drowsy, she was able to talk freely to the following effect: She experienced palpitations one night when the guns fired; she was in the house with her daughter, aged 12. Her husband was on night duty—but that wasn't his fault. She also has a baby (wept). There were two miscarriages in between brought on with quinine, which she also tried without success on the last pregnancy. It was wicked, she should never have done such a thing (wept). After the birth of the baby, she was afraid she might kill him (wept). She never really loved the man she married, she was in love with a Dr. X who attended her for some months when she was aged 18–19. At the age of 23–4 she married a man who has been good to her. Only rarely did she experience pleasure in sexual intercourse, but often she gave in to him. In her teens she thought she would lead a gay life, but flirting pricked her conscience. Somehow she feels she has missed something in life (love). This single session revealed that her married life, satisfactory as it appeared on the surface, really involved her in a mass of conflicts. She never desired to have children by a man she did not love, and had harboured death wishes against the baby. The patient made great improvement and departed almost well after a month's stay.

CASE 6.—A man of 39, said to have been worried by the war, and to have become gradually worse after air-raids. Both parents alcoholic. He said that he had broken down a week before admission because of the air-raids. He was worried and terrified at the thought of being parted from his wife and child; supposing something was to happen to them or him; he once thought of turning on the gas and committing suicide. He felt he had not been as affectionate to his wife as he should have been (he said he had not had intercourse with her for 13 years) and put it down to childhood influences: his parents drank and quarrelled, he was unhappy as a child, bullied and timid. When in a drowsy state after an evipan injection he said: "I'm a coward, I wish I were a man. I wasn't able to take it, one heard the whistle of a bomb and all one could do was to lie flat with one's eyes shut" He was discharged recovered after 3 weeks.

CASE 7.—A man aged 58 who blamed the present war and bombing for his symptoms. He had had shell-shock in 1916, neurasthenia in 1920 and neurasthenia from 1929 to 1934. Pensioned from his service. Neurotic heredity. On admission, depressed, worried, felt as if the top of his head was coming off. The outlook seemed black, the idea of ending it all had passed through his mind. He felt restless, everything seemed upside down, he was worried by little things. Described his life as "tragic." Lost his first wife whom he loved; his present wife is temperamentally incompatible. The second marriage had always been "like living on the top of a volcano." Said he got the wind up with the sirens and the climax came when his house was damaged (all windows out, some debris through roof) by bombs about 50 yards away. Had to move to new surroundings and could not settle down. Symptoms since this incident He made a rapid recovery.

CASE 8.—A woman of 52. Cause said to be loss of parents 14 months ago followed by bomb explosion 12 yards from house 6 months ago. Depression and delusions 3 months ago. On admission was in a melancholic state. Inhibited, depressed, anxious looking. Stated that burglars had robbed her house. After 3 weeks' stay showed some improvement. Stated that 6 months ago she had been thrown to the ground by the explosion of a near bomb but could not recollect the circumstances in detail. She received no physical injury. Her nerves were shaken and severe depression had set in 3 months later. She has been discharged much improved.

GROUP 3 (4 CASES)

In this group (2 male, 2 female) the mental illness appeared to be definitely related to air-raids, and no other strain was evident.

CASE 9.—A man of 48. Symptoms attributed to explosion from a bombing attack. Treated for a gastric neurosis during previous 2 months. Complained on admission of "nerves and shock." When bombs exploded his stomach seemed to go over and over, his heart beat faster. One day

he collapsed at his work. His doctor treated him for "the gastric." Under evipan hypnosis he re-experienced fears, tremblings, stomach discomfort. Said he wanted to fight against it and be like other men but had not succeeded. He gradually regained his self-confidence and was discharged recovered.

CASE 10.—A woman of 52. Seven bombs were dropped within a radius of 1000 yards, the nearest being about 10 yards from her; it took off part of roof of shelter and blocked the exit. On admission she complained of a nasty blankness over her head, and said she could not think of anything, and could not seem to speak like other people. Constantly heard German-aeroplane noises. She looked depressed and somewhat agitated. She stated that she had always been a cheerful personality and that the air-raids did not worry her. She remembers being thrown to the ground when a bomb exploded near, and though dazed she managed after an interval to walk home with help. She is regarded as a case of "blast shock." She has made steady improvement and has been discharged as recovered.

CASE 11.—A woman of 35 who complained of "nervousness due to raids." She dreaded the raids and suffered from sleeplessness, diarrhœa, frequency of micturition and headaches. Physical examination revealed no abnormality except some tachycardia. No emotional conflicts were revealed after an intravenous injection of evipan. Her illness is a simple fear reaction and after the mechanism of the symptoms was explained to her she ceased worrying. She has lost most of the symptoms, though some headache still persists. It is hoped to discharge her in the near future.

CASE 12.—A man of 34. A case of concussion from effects of blast. Had never been "nervy" until 5 months ago, when a landmine exploded about 100 yards away. He was thrown to the ground and lost consciousness for a time. There was slight hæmorrhage from the ears for 3 days and he developed severe headaches. No fracture was detected by X-ray examination. No emotional conflicts were elicited after an injection of evipan, and he appeared to have been well adapted maritally and socially. He now exhibits a post-concussion syndrome, complaining of sleeplessness, severe headaches, giddy sensations, throbbing of the temples and difficulty in concentration.

CONCLUSION

In 46 (15·3%) of 300 consecutive admissions air-raids were given as an ætiological factor, but in only 4 (1·3%) was this regarded as having a major influence, and in only 6 (2%) as contributory. Of those in which air-raids appeared to be largely responsible for symptoms, 2 have recovered and 1 is much improved. Of the 6 in which air-raids are thought to have been contributory, 2 have recovered and 2 have been discharged much improved. It is therefore not expected that there will be any burden on mental hospital beds as a result of raids.

I wish to thank Dr. C. J. Thomas, principal medical adviser in psychiatry to the county of Southampton, for permission to make use of the hospital records.

Reviews of Books

Human Biology

By G. A. BAITSELL, professor of biology, Yale University. London: McGraw-Hill Publishing Company. Pp. 621. 26*s*.

THIS textbook suggests that the teaching of biology in American universities is less bound by outworn traditions than it is in our own. It is time we considered whether the concept of evolution—which in the late nineteenth century was rightly the driving force of biological teaching but which is now no longer a live issue—should remain the foundation of biological education. The average student would never discover the importance of modern biology for human life and thought unless in his spare time he turned from his textbooks to more popular scientific literature not usually recommended by his teachers. Professor Baitsell remarks in his preface that most students beginning biology are more interested in the human than in any other living species. "If the human biological material is presented from a comparative standpoint," he says, "the student will learn not only the biology of man, but also biology in its broader aspects, for man is a part of, not apart from, the world of life." In the average zoology course in our universities the existence of the human species is hardly mentioned, still more rarely is there discussion of his place in the economy of nature.

Professor Baitsell's book is an introduction to animal physiology and anatomy, illustrated mainly by man, but dealing also with the physiology of plants and microorganisms. It is perhaps a pity that the physiology is presented entirely in the classical analytical manner, by separate functions, with no discussion of the biology of the organism as a whole which has practical application in hygiene; and the biological foundations of agriculture might have been more specifically discussed with advantage. But in other sections of the book and in dealing with heredity and with the biology of disease, the writer contrives to keep the human relevance of his subjects always before his reader's mind.

The Scientific Photographer

By A. S. C. LAWRENCE, Ph.D. London: Cambridge University Press. Pp. 180. 18*s*.

IN his preface Dr. Lawrence points out that results of great value have been obtained in scientific work by using the photographic plate as a detector of new radiations, but that the photographic technique is still rudimentary; full use of photography is not made in laboratories, and many possess no photographic equipment and no member of the staff with technical knowledge. This is true; methods of photography practised by the average amateur are not good enough for serious purposes. Whether this book goes far to bridge the gap is perhaps doubtful but it does draw attention to the facts. It makes no effort to be a textbook—there are other, more pretentious, works dealing with the technicalities of photography—but it does draw attention to applications that are often disregarded. The early chapters deal with photographic processes and optics. Dr. Lawrence points out that the aperture of a lens is not a complete guide to its rapidity, and gives examples of other factors affecting it. Writing of miniature cameras, he holds on good grounds that no negative should be so small as to need the use of a fine-grain developer.

Chapters on colour photography and on developing and printing are useful. The last chapter should be the most telling for it deals with some of the scientific applications of photography, but it covers too much ground, so that each subject is too cursorily treated. Even so, this work as a whole is stimulating and indicates how laboratory work could with benefit be raised to a higher plane.

Food: The Deciding Factor

By FRANK WOKES, Ph.D. Lond., B.Sc. Lpool, F.I.C., Ph.C. London: Allen Lane. Pp. 144. 6*d*.

THIS Penguin Special is addressed to the general British public. Its aim is to explain the principles of nutrition so that everyone can take steps to get the right food and "help to bring victory nearer." The title is challenging and admirable and can be recommended, with the book, to the Admiralty, the War Office and the Ministry of Food; the Board of Education and the Ministry of Agriculture ought to read it too. The tables in the appendices are useful, though it seems hardly necessary to include cockles, whelks and winkles in so small a book as this. The advice given is up to date as far as possible though the book probably went to press before cheese was rationed—one cheese savoury needs 6 oz. cheese, a month and a half's ration, but this sort of thing is inevitable when conditions change so rapidly. Dr. Wokes repeatedly reminds readers of the important fact that the phytic acid of whole cereals and some vegetables renders their calcium less available, and perhaps the tables in the appendices will convince his brother vegetarians that some of their sweeping statements about the mineral value of wholemeal bread are not founded on fact. It is a pity that diet is presented from the chemical and biochemical standpoint; the jargon of these sciences simply obscures information for the layman: he will buy a copy, try to read it, give it up and probably attach himself immovably to some point which he will magnify out of all recognition, ignoring the sound stuff behind the calories. None the less, the book deserves a wide circulation, especially among those who are inclined to be cranky about diet.

On the strength of BERIN

. . . effective vitamin B_1 therapy

Administration of vitamin B_1 produces rapid results in the treatment of various common polyneuritic and cardiovascular conditions associated with loss of appetite, alcoholism, pregnancy, colitis and febrile illnesses (besides, of course, being specific for the rarer frank beri beri).

Above all, it is important to note that, with increase of appetite and the restoration of health, there goes an increased need for vitamin B_1 in order to render carbohydrate metabolism complete.

Inadequate intake

Loss of appetite is a decisive 'effective blockade' of all nutrients including vitamin B_1, and this is so whether the anorexia is of psychological or physical origin. The 'fancies' of the expectant mother no less than the faddiness of the hypochondriac, the revulsion of the alcoholic at the sight of food no less than the indifference of the feverish patient reduce the intake of vitamin B_1 which itself brings about loss of appetite.

Conditioned deficiency

Such conditions as colitis and diarrhoea and gastritis and vomiting lead either to poor absorption or a wasteful leak of vitamin B_1 supplies.

Increased demands

Febrile illnesses and pregnancy increase the demand for vitamin B_1, and there is need for provision of supplementary supplies.

Therapy with Berin

The use of Berin*, to supply vitamin B_1 in the pure form, is therefore well and widely indicated today. And the amounts of the vitamin in the Berin preparations are satisfactorily high — in line with current tendencies, and so that effective intake whether for protection or treatment can be achieved with convenience and economy.

The daily B_1—one Berin daily

Berin is now supplied in tablets each containing 3 mg. of aneurine hydrochloride B.P. (960 international units of vitamin B_1). Thus one Berin tablet supplies the day's optimum requirements in vitamin B_1 for an adult. The 1 mg. tablet continues to be available: its price *is reduced*. Berin is also available for injection. Each 1cc. Berin ampoule now contains 5 mg. of aneurine; each 1cc. Berin Forte ampoule now contains 25 mg.

**It may be of interest to note that the pure vitamin B_1 for the Berin preparations is manufactured at Greenford, following intensive work involving much original research by the scientific staff of Glaxo Laboratories Ltd.*

Tablets (1 mg.): bottle of 25, now 3/-; 100, now 10/-; 500, now 45/- Tax free.
Tablets (3 mg.): bottle of 25, 5/-; 100, 16/-; 500, 72/-. Tax free.
Ampoules: box of 6 x 1 cc., 7/6, tax 11d.; 12 x 1 cc., 14/-, tax 1/9; 50 x 1 cc., 50/-, tax 6/3.
Berin Forte Ampoules: box of 3 x 1 cc., 9/6, tax 1/2; 12 x 1 cc., 32/6, tax 4/1; 50 x 1 cc., 120/-, tax 15/-.

GLAXO LABORATORIES LTD., GREENFORD, MIDDX. BYRon 3434

PRODUCTS OF THE GLAXO LABORATORIES

'CYSTAZOL'

A POWERFUL URINARY ANTISEPTIC

'Cystazol' is a combination of Hexamine with Sodium Benzoate: its action depends on the liberation of formaldehyde from the decomposition of the hexamine that takes place in the urine which has been rendered acid by the sodium benzoate moiety.

'Cystazol' is employed with advantage in cystitis, bacilluria of all types, pellagra, gonorrhœa and septic conditions of the urinary tract generally.

COMPRESSED TABLETS of 'Cystazol'

Supplied in bottles of 20, 40, 80, 160 and 500 (10 grain) tablets, at 1/6, 2/6, 4/6, 8/6 and 20/-

EFFERVESCENT GRANULES of 'Cystazol'

Supplied in bottles at 2/6

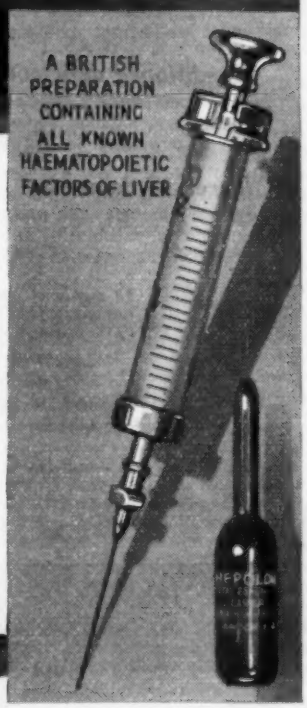
All prices subject to Purchase Tax.

Allen & Hanburys Ltd., London, E.2

Telephone: Bishopsgate 3201 (12 lines) Telegrams: "Greenburys Beth London"

HEPOLON

A BRITISH PREPARATION CONTAINING ALL KNOWN HAEMATOPOIETIC FACTORS OF LIVER



TOTAL LIVER EXTRACT FOR PARENTERAL INJECTION

is produced by improved processes which conserve all the known hæmatopoietic principles of the whole liver; it gives no reactions for histamine or undesirable protein. HEPOLON approximates to the extract described by Gansslen; later extracts have been described as of narrower therapeutic value.

HEPOLON not only passes the highest clinical tests for potency against pernicious anæmia but contains Whipple's factor, Wills's factor, vitamin B_2, nicotinic acid, and the hæmatinic minerals of liver.

Prices in Great Britain and Northern Ireland (subject to alteration without notice):

Ampoules of 2 c.cm.: box of 6, 6/-, box of 12, 11/6, and box of 24, 22/-

Rubber-capped vial of 10 c.cm., 5/-, and of 30 c.cm., 12/6

ALLEN & HANBURYS LTD · LONDON · E·2

Telephone: Bishopsgate 3201 (12 lines) Telegraphic Address: Greenburys Beth London

THE LANCET

LONDON: SATURDAY, JULY 19, 1941

TAMING THE ANÆSTHETIC

ETHER is admittedly the best general anæsthetic we have. It is less toxic for the patient than any other liquid anæsthetic, and it is relatively cheap and easy to handle. But it suffers from two drawbacks. One is chemical and unavoidable. Its inflammability and low flash-point make constant vigilance the price of safety and forbid the use of many forms of electrical apparatus. The other, which is physical, is shared with every other liquid that has to be vaporised before it can be used. A great deal of heat is required for the conversion from liquid to vapour and how to supply this heat has taxed the ingenuity of every anæsthetist since ether was introduced. The rough and ready way was to let the patient's breath do the warming, whether by mere conduction or by the heat liberated in condensing its water vapour. In the process both anæsthetic and apparatus were apt to get chilled and in practice an even flow of warm, accurately dosed ether vapour was never reached. A flash of genius in seeing the obvious has now solved this difficulty at the Nuffield department of anæsthetics, Oxford, where they have set a thief to catch a thief. If at 34° C. ether mops up no end of heat for the change from liquid to vapour, at a degree or two lower (say 30° C.) melted crystals of calcium chloride will provide a reservoir of heat at a constant temperature on their change from liquid to solid. Place the crystals between the hot water and the ether and the heat will get through all right, but only at precisely the required level, neither too hot nor too cold. To vaporise 15 fluid ounces of ether in an hour requires no more than a kilo of crystals and a jug or two of hot water. How the end was reached and the constructional difficulties overcome will be read with keen enjoyment by everyone who appreciates the adaptation of simple means to a harmonious end.

Now that ether vapour can be handled as freely as nitrous oxide, its concentration measured and dosed at will, and the vapour mixed in any desired proportion with oxygen or other gas, ether may reveal hitherto unsuspected virtue as an anæsthetic. The Oxford vaporisers will make it easy to explore the lighter planes of anæsthesia which were difficult to maintain with the older methods. Anæsthesia at these levels is particularly desirable in shocked patients and for that reason ether has been widely discarded in the emergency operating room. Tamed by the new method it may do better when given another trial. In the laboratory too the vaporisers will be very welcome, for they will enable the experimental physiologist to gather accurate data about narcosis in animals. There is a growing appreciation of the importance of depth of anæsthesia, and the application of laboratory findings will supplement and enrich clinical experience. Happily there need not in this instance be the usual lag between scientific conception and delivery. The vaporisers have had the most scrupulous antenatal care and engineering craftsmanship of the highest order is attending their birth.

OVERDUE LEGISLATION?

THE Pharmacy and Medicines Bill gives our legislators the chance to do a greater service to the nation's health than they have achieved for many a year. For reasons not invariably creditable to the democratic system of law-making, previous opportunities of controlling the predatory advertisement of quackery have been neglected. Select committees have patiently examined evidence and have put forward recommendations; bills have been promoted; but overdue reforms have been thwarted either by the apathy of the M.P. or by the alertness of vested interests. Even a postmaster-general has refused to censor the advertisements carried in his books of stamps; national health meant less to him than revenue. Even now the Pharmacy and Medicines Bill, though sponsored by the Minister of Health, owes its genesis and impetus to fiscal considerations. It is the aftermath of a finance bill. Successive chancellors of the exchequer have become conscious that the medicine stamp duties are anomalous and anachronistic, that litigation might at any moment reveal fatal irregularities in the collection of the tax and, in short, that the repeal of the duties cannot be delayed. The loss to the Exchequer would be some £840,000 per annum, but at present the application of the purchase tax to medicines is likely to bring in more than three times as much. Our administrators cannot fail to be aware of the fantastic incidence of these ancient medicine duties which the High Court has described as a mass of confused and obsolete verbiage. "Cough mixture" is taxable, "chest mixture" is not; "backache and kidney pills" are taxable, "back and kidney pills" are not. It is not the fiscal or administrative aspects which interest the medicine-buying public or the medical profession. Lord HORDER put the point significantly a few years ago when he said that, for every hundred pounds spent by the government in making people health-conscious, the quack medicine-mongers were spending a thousand in making them medicine-conscious. In the words used by the Minister of Health in introducing the bill on July 8, opportunities still exist for the unscrupulous to trade upon the credulity and fears of the ill-informed by the production of useless (or even harmful) secret preparations, and to delay the seeking of proper advice and prompt treatment for serious diseases by advertising quack remedies. Existing laws check advertisements of cures for venereal disease and cancer. The Government's bill proposes to extend this restriction to Bright's disease, cataract, diabetes, epilepsy, glaucoma, locomotor ataxy, paralysis and tuberculosis. This is nearly the same list as in the Duckworth Bill of 1936, though it omits the 1936 proposals for a further extension to cures for amenorrhœa, hernia, blindness and structural or organic ailments of the auditory system. The new bill also proposes, as did the bill of 1936, to forbid advertisements relating to abortion. The restrictions now put forward go no further than the code of advertising standards already voluntarily adopted, to its great credit, by the Proprietary Association of Great Britain. Other features of the bill speak for themselves—a justifiable improvement of the pharmacists' position, a balanced agreement between vendors who are chemists and those who are not, and an important clause to compel

disclosure of the ingredients of medicine sold by retail.

Thunder comes up without warning, and many may have been surprised when a leading article in a great daily newspaper thundered against the bill on the morning of its second reading. Reform, we were led to infer, was inopportune in war-time. It seemed to be forgotten that the parallel restriction on advertising cures for venereal diseases was enacted in 1917, that valuable legislation for controlling the sale and possession of narcotic drugs (placed permanently on the statute-book in 1920) had first been initiated by defence of the realm regulations during the last war. A great sum, which has been put as high as thirty million pounds, is spent yearly on self-medication; might not some of this be usefully diverted into war-time savings? The bill, we were told, is an example of legislation based on decisions taken without full consideration of their consequences. This criticism seems to suggest that the Select Committee on Patent Medicines never "reported" in 1914, nor the Select Committee on Medicine Stamp Duties in 1937, that the Government gave no pledge in 1934 to carry out the sensible agreement then reached between the coöperative societies and similar bodies, the chemists and the Home Office, that Sir NORMAN BIRKETT'S strong committee never urged in 1939 the suppression of advertisements of articles for procuring abortion, and that neither House of Parliament has ever been addressed on the topic of the quack medicine trade. Everything in fact is well if only it be left alone. Fortunately the thunder passed over almost unheeded. The bill received its second reading without a division. Some minor amendment in committee is inevitable, but we hope and believe that Parliament will not fail to pass this useful measure into law.

LAVAGE RETURNS

"I now come to Carrel's procedure of intercalating between the complete dressings a frequent flushing and refreshing of the wound surface and for carrying out this flushing unlaboriously. Allow me to say that we have here, I think, far the most important contribution made to surgical technique since the beginning of the war. But to that let me add, that while Carrel's procedure gives us a new and improved technique for the application of antiseptics, much more does it give us a new and improved technique for physiological treatment. For that treatment the assiduous removal of corrupted and corruptible discharges is, as you know, the primary desideratum."—Sir Almroth Wright. THE LANCET, 1917, **1**, 948.

WHEN this was written CARREL'S method of treating infected wounds by intermittent lavage with Dakin's fluid had proved its value, and in the two years since its perfection at Compiègne had established itself as a routine in the Allied war hospitals. WRIGHT supported it not so much because of the antiseptic action of Dakin's fluid, as because, while removing dead material from the wound, it allowed the full antibacterial and digestive effects of the exudates to act during the intervals between irrigations. Though the method marked a great advance, in the last two years of that war BAER and WINNETT ORR, and to some extent OGILVIE and others, were already using the closed-plaster method which was based on almost a completely opposite principle. Here the main accent was on the support and rest of healing tissues, and the organisms were let alone. It was left to TRUETA in the Spanish War to raise closed plaster from the fancy of a few to an unopposed favourite. Nothing that has happened in this war has lessened its reputation: from every casualty hospital have come glowing reports of its value—of the saving of life and limb, the smooth painless convalescence, and the little nursing required. We have become as attuned to pus as the surgeons of the pre-Listerian era, and like them have accepted MATAS'S remark that "not all cheese that smells bad is bad." Lately we have seen even TRUETA'S results surpassed where his methods are combined with the local and general use of the sulphonamides.

After such triumphs no-one would have foreseen a swing-back to lavage, and yet there are signs of one. BUNYAN and VAUGHAN HUDSON and others [1] have lately described and reported on a method of enclosing wounds in specially treated silk envelopes to permit of lavage with a solution of hypochlorite made by the electrolysis of salt water. As in CARREL'S method the irrigation is intermittent. CARREL advised some 20 douches a day; BUNYAN in general gives 3. BUNYAN claims that electrolytic sodium hypochlorite has advantages over Dakin's solution, being less irritant because it contains no free caustic soda, more constant in composition, and more effective because it contains ozone. These claims seem in his paper to be unsupported, and it is unfortunate that many of the other desirable features possessed by any therapeutic solution of hypochlorite should here be ascribed to the electrolytic solution only. Nothing but a controlled series, either human or animal, can decide whether Dakin's solution and eusol must really be counted back numbers, and the unbeliever may demand more evidence than HANNAY gives us of the inferiority of saline. All this must be for further inquiry. It does seem certain however that, like CARREL, BUNYAN has hit upon a highly convenient way of carrying out his irrigations. With the technical assistance of Mr. WILLIAM STANNARD he has evolved a treated silk fabric which can be made to fit over the wounded part, the edges being stuck to the skin so as to form an airtight joint. Thus for a wound of the hand the whole hand is enclosed in the envelope, whose edge is attached half way up the forearm. There is then no need for dressings between irrigations—indeed the progress of the wound can be kept under constant observation—and yet as long as the envelope is intact there is no risk of contamination from outside. Even where irrigation is not required VAUGHAN HUDSON finds the silk envelopes often a convenient and adequate cover for a wound.

The new method has so far been used for some six months, and it is perhaps premature to say, as BUNYAN does, that the problem of secondary infection will not now arise, and that catastrophes seen heretofore cannot now occur, though the 5 illustrative cases he describes are sufficiently encouraging. He is unfair when he says of war surgery that some of the therapeutic advance up to date has been of an empirical, trial and error type, for in this war new methods have been remarkably carefully checked by experimental and other animal work. Some, too, will not agree with him that active and passive movements of the injured parts at all times are an advantage. C. R. and E. L. CLARKE [2] have demonstrated that the

1. Bunyan, J. *Brit. med. J.* July 5, 1941, p. 1; Hudson, R. V. *Ibid*, p. 7; Bruce Pearson, R. S., Lewis, E. E. and Niven, R. B. *Ibid*, July 12, p. 41; Hannay, J. W. *Ibid*, p. 46.
2. *J. Anat. Lond.* 1940, **74**, 309.

slightest movement may tear young and tender healing tissues, and BARNES and TRUETA [3] have shown in animals how immobilisation controls the absorption of both bacteria and toxins. Only in the case of the fingers, where the stagnating lymph glues the small joints, is early movement required; of other joints OGILVIE [4] has written that "early movement is as unsound as the early movement of fractures." HUDSON has used the envelope plus hypochlorite method in 60 cases, including burns, ulcers and gangrene, severe lacerated wounds and acute pyogenic lesions of the hands and elsewhere. In all of his cases where sepsis might be expected the sulphonamides were used as well, and it is not easy to assess how much credit must go to them. HUDSON regards this as a valuable addition to the surgeon's armamentarium, though not as a competitor. The full possibilities of this new form of an old weapon have yet to be explored, and its applications in the treatment of wounds may turn out to be limited. In the treatment of burns, for which it was designed, and especially those of the hands and face where early skin-grafting is particularly desirable, it is likely to find its greatest use. What it needs now, as HUDSON says, is care and thought; and unbiased thought at that.

KEEPING COOL

MAN and the horse have the advantage over most animals in owning skins which act on the same principle as a butter-cooler, and a very effective principle it is if the air is dry. LEE [5] quotes an eighteenth-century experiment in which a healthy man, accompanied by a raw beef-steak, submitted himself to a dry atmosphere at 250° F. and was all right at the end of a quarter of an hour, while the steak was nicely done in 13 minutes. On the other hand, two brothers recently described by SUNDERMAN,[6] in whom sweat glands were congenitally absent, must give up work in summer, sleep on a cellar floor and go about in wet clothing. LEE has studied man's reactions to hot climates in Britain, Singapore and Australia and he concludes that four types of crisis are possible when conditions overpower the body's normal mechanisms of skin adjustment: hyperpyrexia (true heat stroke); circulatory insufficiency (heat prostration); electrolyte imbalance (associated with cramps); and hyperdehydration. Clinical cases rarely exhibit one syndrome exclusively, though they can often be assigned to a single category from the majority of their signs. Immediate passive adaptations do little to protect a man against prolonged heat: a rise in the temperature of the skin and lung surfaces increases the rate of heat loss and promotes the evaporation of surface moisture. Primary active adaptation includes cutaneous vasodilatation, sweating, and water shifts with dilution of the blood. The significance of the blood dilution is not clear, but with the sudden vasodilatation the capacity of the circulation is increased and the extra blood-volume helps to maintain circulatory efficiency and enables the body to get full value out of the vasodilatation. If the primary measures fail the body is driven to secondary adaptive mechanisms, of which there are five: rise of body temperature, increased pulmonary ventilation, reduced appetite, alteration of endocrine balance and reduced muscular activity. If these are not successful in maintaining thermal equilibrium disturbances of the cardiovascular system, of acid-base and water and electrolyte balance, and of the nervous system may develop, providing stepping stones to failure of adjustment. DREOSTI finds [7] that natives working in the Rand gold-mines are liable to either syncope or heat-stroke unless they are carefully acclimatised to full work in the deeper parts of the mine. New workers are given light work underground for a week or more, and are only allowed to take on full work when adaptation is complete. Such adaptation can only be achieved, it seems, by letting the man start work in a relatively hot place and gradually increasing his output, which on the first day should be almost nil. Natives who go home to their villages for six months on extended leave must be freshly acclimatised on their return. The time taken by different subjects to adapt to full working conditions varies, and on the City Deep mine a heat chamber has been fitted up in which the powers of adaptation of new workers can be estimated under controlled conditions of work and atmospheric environment. Among DREOSTI'S cases the first symptom of heat-stroke was often maniacal excitement; at the onset sweating ceased and was absent throughout the acute stage of the condition, only returning when, and if, recovery began.

Protective measures taken against heat must vary with the type of climate—a point which has perhaps received too little attention in the past. The native inhabitants, as LEE indicates, have usually solved their problem successfully and empirically. The Arab, in a hot dry climate, wears thick loose robes which shield him from radiation and set up mild convection currents whenever he moves; his houses are thick-walled and small-windowed, built about a central courtyard, and all openings are kept shuttered until evening. The Polynesian, living in moist heat, wears scanty clothing which cannot obstruct the evaporation of sweat into the almost saturated air, and builds his houses of lath and thatch lightly and airily. Only the European tries to rise above these obvious considerations and builds identical hotels in dry and wet tropical lands. The ingrained conviction that the west must know best was illustrated when Florence Nightingale wanted all Indian hospitals to have widely opened windows. It took the united voices of all the doctors in India and finally the command of the Viceroy to make it clear to her that the patients would be cooler with the windows shut. Foil surfaces, as CROWDEN has shown,[8] can be used to reflect radiation, whether used in the construction of houses or of solar topees; topees lined with aluminium foil are now being worn by our troops in the east, and portable cubicles insulated in the same way and supplied with air-conditioning plants are also in use. LEE discusses the effect of the screening of doors and windows against mosquitoes and concludes that in hot dry climates the interference with air movement occasioned by such screens is not detrimental, but that it is a decided disadvantage in hot wet countries unless profuse sweating is taking

3. Barnes, J. M. and Trueta, J. *Lancet*, 1941, **1**, 624.
4. Ogilvie, W. H. *Ibid*, p. 471.
5. Lee, D. H. K. University of Queensland Papers, Dept. Physiology, December, 1940, vol. 1, No. 5.
6. Sunderman, W. F. *Arch. intern. Med.* April, 1941, p. 846.
7. Dreosti, A. O. *S. Afr. J. med. Sci.* 1937, **2**, 29.
8. Crowden, G. P. *Lancet*, 1934, **1**, 37; see 1938, **2**, 1060; and 1939, **1**, 1244.

place. Simple air conditioning can be achieved by allowing a large fan to blow through some porous material, such as hessian, which is kept wet by water siphoning from a trough. But, as LEE says, the maintenance of health in hot places turns finally on the common sense and self-discipline of the resident himself. He must steer a careful course between the excessive heat production induced by violent exercise and the indolence which may grow on him, mentally and physically. The margin of safety in the body's reserves is reduced in tropical climates and a man can less easily afford to ignore hygiene and offer dietetic insults to his organism. He must aim at a balanced diet—with a high fluid and salt intake to meet the loss in sweat—at moderation in alcohol, a high degree of cleanliness, and early attention to ailments.

Annotations

TOBACCO AND CANCER

IT has been long and widely held that a causative relationship exists between tobacco and cancer of the mouth and lip, but the reasons for the belief, which were well summarised by Shürch and Winterstein,[1] are slender and circumstantial. Cancer of the lip is more common in men than in women; patients with leukoplakia and cancer of the mouth are more often smokers than not; cancer in pipe-smokers often arises at the point where the pipe rests against the lips; when cancer occurs inside the mouth the site affected is commonly that where the smoke jet strikes it. From these observations, and from recent knowledge of the synthetic carcinogenic chemicals, one might guess that tobacco smoke contains a carcinogenic chemical comparable in potency to one of the weak and slowly acting new compounds. But early experimental work failed to give any support to clinical opinion. Though many attempts were made to produce cancer in animals with tobacco tar or smoke yet carcinomatoids or true carcinomas were rarely observed. Roffo of Buenos Aires first obtained a papillary carcinoma on the ear of a rabbit in 8 months of treatment with tobacco smoke condensed in water. His next success was got in a rabbit from a jet of tobacco smoke after 3 years' treatment. Others had similar isolated successes. Argyll Campbell was first successful with mice, obtaining one carcinoma after 16 months of painting. In *Cancer Research*, the new official organ of the American Association for Cancer Research, Flory[2] of Chicago discusses previous attempts and records his own outstanding successes. Of 12 rabbits painted on the ears with tar produced by the destructive distillation of tobacco at 350–700° C. all developed tumours at the site of painting between the 49th and 79th days. The tumours were papillomas and carcinomatoids. A destructive distillate made at 130–350° C. produced 45 tumours in 16 out of 17 rabbits but did so more slowly. Of these, 40 were papillomas and 5 carcinomatoids. In 22 out of 24 rabbits painted with tar from tobacco smoked in pipes at 520–730° C., 38 tumours were produced in 37–374 days; 36 of these were papillomas and 2 carcinomatoids. In trials on a large number of mice 15 papillomas and 2 carcinomas were produced. These developed late, between 7½ and 17 months. The objection may be raised that the carcinomatoids, or locally malignant tumours, of the rabbits' ear, are not carcinomas. But this type of tumour is the response which the rabbit's ear makes to the application of coal-tar. The same tar which in mice yields 60% of carcinomas will cause mainly papillomas and carcinomatoids, with only a few metastasising growths, in rabbits. Just as tar papillomas and carcinomatoids are true indicators of the presence of a specific cancer-producing substance in coal-tar, so they point to some similar compound in tobacco smoke and tobacco tar. Flory's success where so many have failed must be attributed to his methods of making the tobacco tar and smoke. Many of the conditions both of production and application were of course far removed from those under which human beings smoke tobacco. Nevertheless the one probably essential condition—the temperature at which the tobacco is burnt—was the same. Tobacco smoked slowly in briar pipes burns at 425–560° C. and rises to 600° C. or even 700° C. after a few puffs. The temperature in clay pipes rises to 645–704° C. and in cigarettes to 604–670° C. The fractions of tobacco distillate used by Flory were made in a specially constructed still so that they could be collected at these and other temperatures. Flory's experiments, together with the experience of others, point to the production during the destructive distillation of tobacco of a weak and slowly acting carcinogenic chemical, a conclusion which is in accord with clinical observation.

1. Shürch, O. and Winterstein, A. *L. Krebsforsch.* 1935, **42**, 76.
2. Flory, C. M. *Cancer Res.* 1941, **1**, 262.

TRANSPLANTED TEETH

OUR teeth never seem as personal as other parts of our bodies. We should resent premature decay in our fingernails or the presence of moth in our hair, but when our teeth rot in our head we are acquiescent, and experience no sense of crippling when they drop or are pulled out. The thought of transplanting a growing tooth, therefore, seems little more than a matter of gardening. Two Soviet scientists, A. Lapchinsky and A. A. Malinovsky are reported to have grown tooth rudiments in alien gums.[1] They extracted teeth from anæsthetised adult dogs and transplanted into the sockets rudiments of permanent teeth taken from below the milk teeth of puppies. These grew to full size in the adult dogs and the same result was achieved if the puppy had been killed on the previous day and its jaw kept in a refrigerator overnight. The logical outcome of these experiments would be to discover whether the principle could be applied to human dentition—whether, for example, tooth rudiments from a child could be transferred successfully to an adult human jaw. Dental surgeons already enucleate the tooth germs of the lower wisdom teeth in children when there is clinical and radiological evidence that the teeth cannot erupt normally; but there are practical difficulties to their transplantation. With perfect technique successful transfer might in theory be achieved in about 60% of cases; but if the tooth follicle or the germ of the enamel organ was damaged in the process then a follicular or dentigerous cyst might develop or the growing tooth might be malformed. A cyst might also form if the surrounding bone grew over and encapsuled the transplanted rudiment; but the growing pressure of the tooth would probably overcome this difficulty, causing absorption of the obstructing bone. Sepsis might also cause trouble; healthy mouths are the rule in dogs but an adult human mouth is rarely completely free from sepsis, and the implanted tooth might well act as a foreign body causing bone necrosis. Even if it were possible to obtain tooth germs from the jaws of children killed in accidents, the chance of success in transplanting would be remote; and the idea is not wholly inoffensive.

A further objection to the operation is the time factor. The lower incisors, for example, are formed 4½–5 months after birth and begin to erupt when the child is 6 years old; the crown is fully erupted 6 months later but the root is not formed until the child is 10. Thus an adult receiving such a transplant would only boast the crown of the tooth 6 years after the operation and would have to wait another 3½ years for the root; even the most

1. Circulated to the press by "Industrial and General Information."

patient of men might prefer a porcelain one in the meantime. The position in a child is rather different: in many children the first molars decay early and have to be extracted; and it might well be possible to transfer a child's own wisdom-tooth rudiment to the first molar socket; the time-lag in that case would not matter providing the necessary space for eruption was maintained with a dental appliance. It is not certain, however, that the transferred molar would erupt in normal occlusion with the upper teeth: the factors governing the height of an erupting tooth are not fully understood. Possibly the pressure of the occluding tooth might be the deciding factor, and in that case the implanted tooth might well erupt into normal occlusion.

And finally the use of transplants between different subjects would have to overcome obstacles which are not merely technical in a limited sense. There is evidence of innumerable antigenic differences between members of the same species, as we have lately noted.[2] Blood-transfusion is a comparatively simple operation, but it would have had little practical application if there were 4000 blood groups instead of 4. Genetic and serological work here and in America suggests that this is roughly the type of problem confronting the surgeon attempting to graft adult or embryonic tissues. Lapchinski does not seem to have been greatly hampered by antigenic differences in his dogs—indeed, he does not mention these recent genetical studies. His approach is otherwise critical and his successes make his work worthy of attention. It may be that an implanted tooth germ functions as an organiser, the original cells inducing a new germ in the host though failing to survive themselves. We may look forward to a day when workers familiar with English and American genetical techniques will be able to study the work of this Russian school at first hand.

PILL'S PROGRESS

THE pill-bouncing contest at the Pharmaceutical Society is one of the Entertainments At Which We Have Never Assisted. But everyone knows that the pharmacist takes an artist's pride in turning out pills like ball-bearings. The doctor's outlook is warped by memories of his own products made when a student. In those days his sense of inferiority was largely dispelled by his clinical teachers, who assured him that his lustreless and pultaceous masses would readily disintegrate in the alimentary canal and have a good chance of undergoing absorption, whereas the shining spheres of the expert could often be recovered as good as new from the fæces. The resistant pill, however, is not without virtues. It resembles the time-bomb, whose chief merit is not that it explodes but that it explodes at the right moment. The case-hardened pill can be made to pass through the stomach unchanged and liberate its contents in the lower reaches of the alimentary canal. The efficiency of the various substances used to protect the active principles in a pill mass from destruction in the gastric juice has been investigated by Lark-Horovitz and Leng[3] of Indiana, who employ radioactive indicators. The pill covering was imitated by using a gelatin capsule coated with a mixture of shellac, castor oil and alcohol. The capsule was filled with sodium chloride previously rendered radioactive by bombardment with deuterons. Liberation of the activated salt from the capsule and its entry into the circulation were signalled almost immediately by the appearance of radioactivity in the subject's extremities (the hand was used by these workers). Simultaneously the progress of the capsule along the alimentary tract was observed by means of a movable electron-counter. The one used is presumably a modification of the Geïger electron-counter, in which the electrons thrown off by a radioactive material are deflected on to a fluorescent screen where each "hit" shows as a glowing dot. Thus it was possible to say how long the capsule had been able to withstand the action of the digestive juices of the alimentary canal, and also to correlate this finding with the approximate position of the container in the stomach or intestine. It was shown that a well-made enteric-coated pill released none of its contents during a stay of 2 hours in the stomach; but as soon as it passed into the intestine radioactivity appeared in the peripheral tissues and steadily increased for the next 6 hours. On the other hand, a pill which had a defective enteric coating began to liberate its contents some 20 minutes after administration and while it was still in the stomach. The effect of leakage produces a graph quite different in pattern from that which is obtained when the contents of the capsule are suddenly liberated by digestion in the bowel. Twenty-one experiments were made with hand-coated pills. It was found that 66% dissolved in the intestine and only 10% in the stomach; the corresponding figures for ten experiments made with commercial coatings were 50 and 40%. At a time when so much reliance is placed on factory-made products these results are somewhat disconcerting. This is an ingenious application of the use of "marked" atoms that has already been applied to several biochemical and pharmacological problems, such as in Whipple's work on the fate of ingested iron and J. H. Lawrence's investigations into the phosphorus metabolism of leucocytes in health and disease. It will certainly be applied to many more in the future but the investigator will need to bring to his task a fair knowledge of the newer chemistry and more than a smattering of mathematics.

2. Lark-Horovitz, K. and Leng, R. H. *Nature*, May 10, 1941, p. 580.
3. *Lancet* July 12, p. 43.

METHÆMALBUMIN

THE demonstration by Fairley and Bromfield that the pigment appearing in the blood-plasma in hæmolytic diseases is not methæmoglobin but methæmalbumin is now well-established. The distinction is of considerable practical importance and Fairley[1] has therefore brought together all the information that he and his co-workers have compiled so far. The spectroscope is the most useful instrument for distinguishing the various blood-pigments, but it happens that the three pigments methæmalbumin, methæmoglobin, and sulphæmoglobin all show an absorption band—the α band—in the red part of the spectrum, and although they are in different positions they are sufficiently close to make distinction by the usual direct vision spectroscope very difficult. Two lines of investigation, however, help to overcome this difficulty. Methæmoglobin and sulphæmoglobin when they appear in the blood—for example, in sulphanilamide or other drug poisoning—are confined to the corpuscles; they are not free in the plasma. Methæmalbumin, on the other hand, occurs only in the plasma and not in the corpuscles. The hæmoglobin that appears in urine is oxyhæmoglobin; if the urine is acid a proportion of this is converted in the renal tubules into methæmoglobin; methæmalbumin and sulphæmoglobin do not appear in the urine. Secondly, by treating the pigments with reducing agents, different changes are brought about. With Stokes's reagent (ammonium ferrotartrate) or dilute ammonium sulphide the α band is dispersed in the case of methæmoglobin but unaltered in methæmalbumin and sulphæmoglobin; with concentrated ammonium sulphide the α band of both methæmalbumin and methæmoglobin is dispersed while that of sulphæmoglobin remains unaltered. These changes are easily observed with the direct-vision spectroscope. Failure to distinguish between these three pigments has led to much confusion in the terminology and classification of hæmolytic diseases. "Hæmatinæmia" is a misnomer, since hæmatin when formed

1. Fairley, N. H. *Quart. J. Med.* 1941, **10**, 95.

combines at once with serum albumin to form methæmalbumin. The hæmolytic methæmoglobinæmias and sulphæmoglobinæmias of van den Bergh were probably both examples of methæmalbuminæmia. Methæmoglobin, so long as it remains within the corpuscles, can be converted back to oxyhæmoglobin; sulphæmoglobin, however, is an irreversible compound—lysis of red cells will release the pigments into the plasma but methæmoglobinæmia or sulphæmoglobinæmia is not produced. Both these pigments have to be present in considerable amounts to be detected spectroscopically and they are probably not present as such for long, for if they are incubated with plasma at 40° C. methæmalbumin is produced, and it is likely that this represents their fate in vivo. Fairley suggests that hæmolytic anæmias can be put into three groups. In one hæmoglobin appears in the urine, methæmalbumin and excess of bilirubin in the blood-plasma; the second is similar but without hæmoglobinuria; in the third only hyperbilirubinæmia is present. In the first two groups hæmolysis is occurring predominantly in the blood-stream whereas in the third the reticulo-endothelial system is responsible. We have standard methods for detecting hæmoglobin in the urine and bilirubin in plasma or serum; methæmalbumin can be demonstrated by direct spectroscopy only if considerable amounts are present, but it can be converted by a reducing agent into a spectroscopically sensitive hæmochromogen with a clearly defined absorption band at 558 mμ (yellow-green). This reaction is known as Schumm's test and was originally used to detect the presence of hæmatin, but from what has already been said it is clear that a positive reaction in a specimen of serum indicates the presence of methæmalbumin, and this is the best way of detecting methæmalbumin. The test is carried out by covering a known volume of serum with a layer of ether and then running in with a pipette one-tenth the volume of concentrated ammonium sulphide and a few drops of ammonia; the mixture is shaken and the direct vision spectroscope can then be used to look for the characteristic absorption band. The van den Bergh test for bilirubin is asked for in every case of suspected hæmolytic anæmia; Schumm's test should be used just as often.

FIRST-AID FOR BURNS

THE differences of opinion and changes in practice with regard to tannic acid have led to some confusion in both laymen and doctors called on to apply first-aid to burns. In E.M.S. Memo No. 7 (H.M. Stationery Office, pp. 4, 2*d*.), issued by the Department of Health for Scotland, the principles as modified by modern views are restated. In local treatment the layman is told to cover the exposed parts of the burn with a clean dry sheet, towel or cloth, and under no circumstances to apply oil, grease, flour, soot, baking soda or lysol. The medical attendant is advised in severe cases, which include all burns of the face and eyes, hands and feet, to control pain with morphine rather than local applications; this implies that before moving the patient to hospital he should keep to dry dressings. The moderate burn which can be treated fully at the first-aid post should be cleansed before the application of a coagulant, using soap where necessary, followed by saline, and avoiding ether or alcoholic solutions and vigorous rubbing or scrubbing. For general use a coagulant in a water-soluble base is advised. The recommendations for difficult areas are usefully illustrated in a diagram and summarised as follows.

Palmar surfaces of fingers and hands.—Snip blisters, but do not remove epidermis. Apply gauze soaked in 1/1000 euflavine.

Flexures.—After cleansing and removal of epidermis, apply gauze soaked in 1/1000 euflavine.

Face.—After cleansing, apply jelly spread on a mask of gauze cut to fit with holes for eyes, nostrils and mouth.

Eyelids.—Eyelids should never be coagulated, but thickly smeared with sterile soft paraffin.

Mucous surfaces of lips and mouth.—Apply sterile soft paraffin.

Ears.—Before cleansing, plug lightly with cotton-wool smeared with sterile soft paraffin. After cleansing, smear thickly with sterile soft paraffin.

Hairy parts.—These must be shaved for at least 2 in. all round the margin of the burn before cleansing with sterile saline.

It will be seen that the memo follows the lines of that issued by the Ministry of Health in February (see *Lancet*, March 29, p. 425), but here no attempt is made to discuss treatment in hospital.

GUY'S IN THE WILDERNESSE

AT the suggestion of the Ministry of Health Guy's has, for obvious and cogent reasons, opened a country branch at the Wildernesse Club at Seal, near Sevenoaks. The first patients moved in on June 30, and on July 9 the annexe was formally opened as "Guy's U.S.A. Hospital." The transatlantic flavour of the name is a token of the hospital's gratitude to the Bundles for Britain Association which has given 10,000 dollars to pay for the adaptation of the house into a hospital. At the opening, Mrs. Edward Murrow, their representative in this country, said that the general pro-British feeling which exists in America needs to be harnessed to particular objectives with a tangible human appeal more satisfying than an intellectual passion for democracy. The Hollywood branch of the organisation has accordingly adopted Guy's, and the advantage of hitching your wagon to a galaxy of stars is clear, for Hollywood has already promised a much-needed deep X-ray therapy plant, fracture beds, and a gastroscope, while Mr. Harry Warner has given £900 to furnish an operating theatre. The new annexe has 120 beds and the resident staff will include a medical superintendent and two medical officers, a lady superintendent, eight sisters, and fifty nurses, while physicians and surgeons from Guy's will be regular visitors. The patients will be air-raid casualties and other civilian sick transferred from the mother hospital. The reactions of patients and staff to a country life will be recorded for consideration when the time for post-war reconstruction comes.

THE KING AND THE COLLEGE OF SURGEONS

AT a meeting last week of the council a letter was read from Sir Alexander Hardinge, private secretary to the King, who is Visitor to the Royal College. I am to assure you, the letter runs, that it is a source of deep regret to His Majesty to learn of the damage to the museum buildings and the loss of valuable specimens resulting from enemy action. The King is, however, much gratified to hear of the further generous gift made by the Bernhard Baron trustees towards the endowment of the professorship of research, which will go far to prevent any of the regrettable interruption which might otherwise have occurred in the scientific work and development of the college.

Sir ALFRED WEBB-JOHNSON has been elected president of the Royal College of Surgeons in succession to Sir Hugh Lett.

AWARDS IN THE R.A.M.C.—The following awards have been made to medical officers in recognition of distinguished services in the Middle East.

C.B.—Colonel (temp. Major-General) P. S. Tomlinson, D.S.O., M.R.C.P., A.M.S.

C.B.E.—Lieut.-Colonel (temp. Colonel) F. G. A. Smyth, O.B.E., M.B. Lond., R.A.M.C.

O.B.E.—Major (temp. Lieut.-Colonel) B. J. Daunt, L.R.C.P.I., R.A.M.C.

M.B.E.—Captain (temp. Major) P. L. E. Wood, M.R.C.S., R.A.M.C.

In England Now

A Running Commentary by Peripatetic Correspondents

THE other evening I went as usual from listening to the news straight to the surgery. Among the patients there was a man I had seen that morning and told to come up again with a tomato leaf. He was a nurseryman and had dermatitis and from its appearance at a significant time each year it seemed likely that tomatoes were the cause. The wireless was still jangling in my head as I cut the leaf for a patch test. V for victory, V for arrowhead from Heaven, V except for the proud phallic I the simplest and probably the oldest letter of them all; that points to man his origin from dust, where he shall go again, where he shall lie; the divine point driven irresistibly downwards, the piercer, the wedge of resolve, God's stream-lined spermatozoon, the emblem of union, two views culminating in one point, the conquering call of the eagle. . . . "It's a funny thing, doctor, but where I am sunburnt, on the face and this side of my arms" (he stroked the extensor surface of his arm) "and on the neck here, I don't get the spots nor the itching." Nature's own cure or preventive, the light from the sun which when reflected would form a V, the light from Heaven reflected on man, V for Victory, V for a positive patch test on a nurseryman's belly, V for vengeance, V . . . —

Gosh, this is becoming an obsession.

* * *

The alarm sounded over the ship's broadcaster; an air-attack was apparently imminent. My position in action was the officers' bathroom which made an excellent dressing station, having running water (in theory at any rate), and several baths which with the addition of boards became crude but serviceable operating tables. The steriliser was switched on and the emergency lighting checked over. In the adjacent compartment the chaplain, the dental officer, my three sick-berth attendants, and a motley crowd of assorted cooks and stewards had gathered, the latter constituting the first-aid parties. Stretchers and bags containing the essentials for elementary first-aid were distributed and the parties trooped away to their vantage points to await casualties. Meanwhile outside events were livening up with a vengeance as far as we down below could judge. Our position having been chosen for its comparative safety we were pretty well isolated from the happenings on the upper deck, and for our news we depended on announcements over the broadcaster or the excited and never very accurate accounts of those people who found their way below. However, the dull concussions of the bombs were pretty obvious, as were the sharper and closer explosions of our own A.A. guns and the occasional chatter of some close-range weapon.

For a time all was well, though I could see my own nervous tension reflected from most of the other faces. Our experience of attacks was too small for us to have become blasé. None the less we all assumed a nonchalant air which was rather spoilt by occasional involuntary starts. At first these occurred at only the louder and more fearsome noises, but as tension grew we leapt like startled stags at even the closing of a hatch. One consolation was that the old hands, the veteran sea dogs, seemed similarly affected, though admittedly not to the same extent.

Our assumed complacency received a rude shock when, with a crescendo of loud explosions, a stick of bombs fell across the ship, the last one very close to the port side, shaking us not a little, both mentally and physically. We straightened up from the crouching positions we had adopted and smiled bravely at one another. There was little time for speculation, though, for soon a confused shouting above with cries of "To you!" "I've got him," and "Take your foot off the blinking rope!" brought us running to the foot of a ladder leading up to a hatch through which protruded a pair of "boots, regulation," neatly fastened up in a Neil Robertson stretcher. The first casualty was arriving. He proved to be a Royal Marine, who had sustained several small splinter wounds, all luckily superficial, and whose chief complaint was against the over-zealous stretcher party, who had clapped him into a stretcher to bring him down to us. Though a bit shaken, he was, as he maintained, "in the pink." While we were dressing him the second casualty arrived—a seaman with a bad wound of his right arm showing a splintered fracture of the humerus and much loss of overlying flesh. Though in a good deal of pain and considerably shocked, he was very cheerful and temporary dressings together with morphia soon had him comfortable. Inquiry on our private telephone line revealed that the other dressing station had received no casualties at all and so the total bag for the near-miss was fortunately very small. It seemed a good excuse, if excuse be ever needed in the Navy, for the making of tea. So we sent the chief cook off on this errand and soon large "fannies" of it arrived, hot and incredibly strong. The casualties had first whack and then, having satisfied our consciences, we proceeded to satisfy our thirsts in no uncertain manner.

This done, there was nothing to do but wait, and waiting is perhaps the worst possible occupation under such circumstances. I cannot pretend that the danger was ever very great, but in our arrogant manner we assumed that we were the principal target and had ample time to analyse the various noises and think unpleasant thoughts about their proximity. Commands over the broadcaster were interspersed with greater and lesser bangs; the gunfire went on and on relentlessly, always accompanied by that curious frenzied shouting which seems to be part of the naval gunners' stock-in-trade. I imagine that the temporary deafness induced by the continuous detonations—and 4 inch is a notorious calibre for this—makes it impossible to modulate one's voice. For several hours this lasted, fortunately without anything more dropping in our immediate vicinity. Then, after a long interval to make quite sure, the "secure" was sounded. The first-aid parties returned with their equipment, all was stowed away and the "disperse" sent us about our business.

While our casualties were being removed to the sick bay and prepared for operation we strolled out for a breath of fresh air on the upper deck. The fires were fading with the growing light of dawn and the smoke was drifting away from the heavily blitzed city. A dockyard policeman, veteran of many raids, said, with no assumed bravado, "You should have been here on Saturday night, that was a real raid that was."

* * *

Like many of his fans I was concerned to see that Mr. P. G. Wodehouse had got into hot water from certain sections of the press. Being anxious to come by some reliable first-hand information on the subject I decided to ring up Jeeves—and what a pleasure it was to hear his voice again! With the possible exception of the Royal Navy I know of nothing that gives such solid confidence in the future of England as those cultured tones. "That you, Jeeves?" I asked. "How are you?" "I enjoy the best of health I thank you, sir." "And Mr. Wooster?" "Mr. Wooster I am happy to say is well. He is in the intelligence service, sir, but I regret that I cannot divulge his immediate whereabouts even to you, sir. I am sure you will understand." "Quite so, Jeeves. Now what's all this I hear about Mr. Wodehouse?" "Mr. Wodehouse, sir? Ah, that would be the literary gentleman who used to spend so much of his time with us. He is, I understand, at present on the Continent, sir." Admiring his discretion and resisting the temptation to tell him to quit stalling I went on "Yes, Jeeves, but what do you think about him?" "Well, sir, I always found him an exceedingly pleasant gentleman, though I cannot speak with authority about his writings not having had leisure or—ahem—inclination to peruse them. They are, I believe, of a somewhat frivolous nature." "Yes, but what would you say about the man himself?" "Well, sir, since you ask me and speaking in the strictest confidence I should describe him as a light-hearted gentleman, not perhaps intellectually profound but—for an author—singularly free from vice." "Thank you, Jeeves. That's just what I wanted to know. You have relieved my mind and I'm grateful to you." "Not at all, sir, will there be anything further, sir?"

* * *

I was a bit doubtful when the lady next door signed her free-milk form in block capitals whether the Minister

of Food would accept that as a signature. I took the advice of the Law.

Dear MIKE (wrote the Law),—All right, I'll ask you another. What d'you mean by signature? If it is just your name on a form for some official purpose, the Government 'll tell you the way it wants you to sign. If it is the signing of a name to show that the writing accords with your wishes or intentions, then the law will tell you what minimum it insists upon. In this connexion it will often accept your initials or just your mark, if they're intended to represent your name. And signature by a duly accredited agent will also do. For signing a will, it's enough to affix a mark, or stamp with an engraved signature, or put your initials. But it ain't enough to trace a former signature with a dry pen, because it leaves no physical sign. The signature to a will ought to be your real name, but where a lady called "Glover" signed as "Reeve" (her first husband's name), the will was held validly executed. In legal proceedings I believe it has been held that particulars filed in a county court action, where the solicitor's name at the end was merely lithographed, were not "signed"; if the solicitor's clerk had signed for him, it would have been O.K. For certain purposes, in contracts and documents creating obligations, the Statute of Frauds requires the document to be signed by the party who is to be charged. Initials have been held to suffice for this. I don't know that this answers your question which perhaps arose out of a distinction between signature and usual signature. The bank knows our "usual signature" to our cheques. We could alter it, if we liked; but if we kept altering it, the result would be a lot of inconvenience to ourselves as well as to the bank. We want to be able to answer confidently if anybody asks "Is this your signature?" And so no more at present from—UNCLE BOB.

* * *

A round at hospital has revealed that Anna is back again. She is a toxæmia of pregnancy with albuminuria. The local hospital and I play battledore and shuttlecock with her, they not caring for the sight of her any more than I do. When the B.P. soars to terrifying heights I send her in for surgical induction, when it subsides they send her out. The score at the moment is vantage nobody (the patient not excepted), my service. Sister, a professional gleam in her eye, asks if I have seen Mrs. S——'s foot? The question is purely rhetorical, as Mrs. S. has been admitted for myocardial degeneration. Her foot certainly presents a unique, and to me undiagnosed problem. The entire surface of the heel is covered with soft warts which pressure has flattened out into thin, pulpy, plates with a central pedicle. These plates are fitted into one another like a piece of mosaic, and the condition is complicated by advanced varicose veins. The cure and treatment, if any, has not yet occurred to me.

Harness, the six-year old diabetic, is leaning out of the baby-room window. "Someone mit move these babies," he begins indignantly on sighting me. "They make too much noise." The noise certainly is appalling, but as Sister and I point out he is under no obligation to stay in the room. Harness pouts, and we realise that his objection to the nursery is the presence of Maria, an old-fashioned party of five and a half who sets Sister and me right on matters of hygiene. "No thank you," she says with frigid politeness when we offer her a piece of barley-sugar. "It's been in the same room as the sick babies." Despite the screw-top to the jar, we feel snubbed, and help ourselves to pieces with overacted enthusiasm. Secretly we sympathise with Harness and to change the subject Sister reminds him that there was something he wanted to tell doctor. Harness goes very pink, stutters, and finally gets the story out with a rush. Toilet paper had run out, and one of the nurses had presented him with a piece of newspaper till she had time to fit a new roll; on it was a photograph of Hitler. "I used it," he announced with awful emphasis, "and then I pulled the plush on him." He giggles, stares intently at us both, and deciding that we lack entertainment value turns back to the window. "Are the gulls interned?" he asks, watching them as they beat up wind to the headland.

SHAFTESBURY MILITARY HOSPITAL MEDICAL SOCIETY.—A meeting of this society will take place on Tuesday, July 22, at 3 P.M., when Major F. R. Bettley, R.A.M.C., will speak on the early diagnosis of common skin diseases.

Special Articles

THE BIOLOGY OF EPIDEMICS

Abstract of the Croonian Lecture given by Prof. W. W. C. TOPLEY *before the Royal Society on July* 17

THE universe of study which today faces the epidemiologist is not, in its essence, composed of a number of cases of a clinically recognisable disease, with a distribution that varies in an observable way in space and time. It is composed of a variety of biological species, some acting as parasites and some as hosts. The parasites may be viruses, or bacteria, or protozoa, or worms. The hosts may be men, or animals, or insects, or plants. The parasite may pass from host to host by direct contact, by indirect mechanical contact, or through the agency of an insect vector. In whatever way it passes, the main factor that determines the occurrence and type of an epidemic prevalence is the frequency of its passage.

If all relevant environmental conditions are held constant, and susceptible hosts are added at a high and steady rate to an infected herd, a steady rate of mortality is attained, with no major waves or fluctuations. If, with a steady rate of addition, the closeness of contact between host and host is changed, increased closeness of contact is followed by the propagation of a major epidemic wave, and decreased opportunity for contact by a rapid fall in the mortality-rate. These experimental observations have many analogies in the recorded prevalence of infectious disease under natural conditions.

During an epidemic prevalence the average resistance of the hosts rises with length of exposure to risk; in part because of the elimination by death of the more susceptible individuals, in part because of the natural immunisation of survivors. The resistance attained in this way, though sometimes high, is never absolute. We can, in many cases, attain the advantages of natural immunisation, without its risks, by an appropriate method of vaccination.

Differences in severity between different epidemics of the same disease are in part accounted for by biological differences between various strains of a single parasitic species, between different races of a single species of host, or between different races of a single species of insect vector. The biological characters that determine the ability of a parasite to spread from host to host are not identical with the characters that determine its ability to multiply rapidly in the host's viruses, so that virulence and infectivity may vary independently.

In attempting to control epidemics we always strive, in one way or another, to decrease the probability of the passage of the causative parasite from an infected to a susceptible host. We may do this by changes in the distribution of the hosts at risk, or by lessening the population density of an essential insect vector, or by reducing the proportion of susceptible hosts by artificial immunisation, or in many other ways. In no case is it necessary, by our own action, to reduce the probability to zero. The epidemic system is in unstable equilibrium. If we tip the balance far enough in favour of the host the system itself will do the rest, and the disease will tend to become very infrequent, and may sometimes disappear.

SCOTLAND

ADMISSION TO E.M.S. HOSPITALS

THE Department of Health for Scotland has announced that whole-time civil defence workers transferred from their homes, and trainees in Ministry of Labour industrial establishments who have been moved from their homes are eligible for admission to E.M.S. hospitals. These patients, in accordance with normal hospital practice, will be given an opportunity of contributing towards the cost of their treatment. Whole-time civil defence workers are already eligible for admission, whether they are in their home areas or not, for treatment of war-service injuries and fractures sustained whether on war service or not. The new extension includes sickness or injury sustained while not on civil defence service but while living away from home.

SUMMER GRADUATION IN ABERDEEN

Dr. W. Hamilton Fyfe, the principal of Aberdeen University, in addressing the new graduates last week said that civilisation did not consist in a material standard of living; moral standards were even more important. It was for moral standards we were fighting—mutual trust, fair dealing, sympathy, mercy and goodwill, and for a genuine respect for the interests of the human intellect and spirit. The price of freedom was eternal vigilance, and the price of civilisation was a sense of responsibility. One nation after another had been enslaved because each considered its own interests in isolation. Slavery awaited all men and women who did the same. Their sense of responsibility required that they should answer any call for service however uncongenial and hard. It made also one of those more trivial demands, often harder to meet than the calls for great sacrifice. When rules were framed to secure for all an equal share of food, clothing or petrol, they must set an example which will put to shame those stupid and treacherous people who try to evade the rules and get more than a fair share for themselves. And on them also lay the responsibility for rebuilding and securing and improving the civilisation of Europe when the war is over. That might prove the hardest and heaviest responsibility of all, but they were privileged people to whom much was given, and of whom much was required.

HONYMAN GILLESPIE LECTURES

The following lectures will be given during the summer vocation at 4.30 P.M. on Thursdays, at Edinburgh Royal Infirmary: July 24, Prof. D. M. Lyon, significance of a systolic murmur; July 31, Prof. L. S. P. Davidson, biopsy of the sternal bone-marrow as a diagnostic procedure; Aug. 14, Prof. D. K. Henderson, the significance of fear; Aug. 21, Dr. A. Rae Gilchrist, the hypertensions; Aug. 28, Sir John Fraser, the antiseptic eras—yesterday and today; and Sept. 4, Prof. D. M. Dunlop, the dietetic treatment of gastro-intestinal disease. The lectures are open to graduates and senior students.

Parliament

Pharmacy and Medicines Bill

Mr. ERNEST BROWN broke a twenty-five-year-old parliamentary hoodoo in sponsoring this bill which came before the House of Commons for second reading on July 8 and which, he rightly said, involved a very old and controversial story. The new bill, in accordance with the Chancellor of the Exchequer's promise, repeals the Medicines Stamp Acts which have become unworkable—indeed the High Court has stigmatised them as "a mass of confused and obsolete verbiage." The general proposition of the select committee of 1937 that medicines could suitably be taxed at 16⅔% ad valorem, which formerly met with much opposition, had now been carried into effect by the Purchase Tax, and the estimated yield of the tax on medicine is 3 million pounds a year, or nearly four times the yield of the Medicine Duty.

There were strong reasons against sweeping away the advantages which chemists enjoyed under the present law, and the bill embodied an agreement accepted by most of the trade interests concerned which substituted a trading privilege for a financial advantage. Clause 7 provides that from the date of repeal of the duties all medicines shall be sold retail only by chemists, together with doctors and dentists, with the exception of herbal remedies, of mineral waters, and of proprietary medicines not described in the B.P. or B.P.C. There was, Mr. Brown added, no desire on anyone's part to interfere with the legitimate practice of legitimate herbalists.

Today there were still opportunities for the unscrupulous to trade on the credulity and fears of the ill-informed, and the advertisement of quack remedies often delayed the seeking of proper advice. This bill would stop these practices. From Jan. 1, 1942, all medicines must bear a statement of their composition or active constituents; the only exception is a medicine supplied to an individual prescribed according to his needs—for instance a mixture made up in accordance with a doctor's prescription. The advertisement of remedies for certain diseases, or of articles for procuring abortion, would be stopped. Advertisements of articles for the treatment of venereal disease and cancer are already prohibited by law and the present bill extends the prohibition to advertisements of remedies for Bright's disease, cataract, diabetes, epilepsy or fits, glaucoma, locomotor ataxy, paralysis and tuberculosis. The bill also makes minor amendments to the Pharmacy and Poisons Act, 1933. A retailer who sells drugs including poisons at a chemist's shop need not have a pharmacist in charge of other shops where he sells drugs other than poisons. The statutory committee of the Pharmaceutical Society when adding or restoring a name to their register may take into account any offence committed by the applicant while not registered. They are also authorised to remove or withhold names from the register for a stated period. Mr. Brown said the bill was the result of infinite shrewdness and goodwill, and he commended it to the House as the first legislative step for a generation on the road to reform.

In the debate which followed members showed a generous indignation that the gullible should be expensively duped. Many thought the measure did not go far enough, while others were anxious that herbalists should have a fair deal. Mr. JAMES GRIFFITHS urged that the real remedy lay in the advance of education and the provision of adequate medical services. Mr. BEVERLEY BAXTER thought the B.M.A. was reactionary but had found herbalists to have social charm. Prof. A. V. HILL rushed to the rescue of the medical profession, and deplored people who scrupulously obey the law, the Ten Commandments and Mrs. Grundy and only show their liberalism by favouring quack medicines. He reviewed with wit and distaste the advertisements of some popular remedies and welcomed the bill which was overdue. We had been respectful and tolerant far too long of the exploitation of the sick and suffering.

Mr. HENRY STRAUSS agreed with Lord Horder that the advertisements of patent remedies often constituted a greater danger to health than the contents of the medicines themselves. Unless the Government were prepared to go much further in the control of advertisements it would be better to drop Clause 3 and combat the evil by sowing distrust in the public mind. Sir ERNEST GRAHAM-LITTLE supported the bill though he was disappointed in its character and its scope. A sum of 30 million pounds a year was extracted from the public for patent medicines, more than was spent on all the hospital services. Advertisements of patent medicines in the newspapers produced a disease consciousness. He agreed with Mr. Strauss that the restrictions on advertisements did not go far enough and he doubted whether they would have much effect. The bill states that the description of a remedy may take the form of a reference to it in the B.P. But, Sir Ernest asked, did the purchaser of medicine in a shop know the British Pharmacopœia? Mr. RHYS DAVIES pointed out that 20 million out of our population of 44 million were entitled to free medicine under the National Health Insurance scheme. If the sale of proprietary medicines was still being maintained that was a commentary on the gullibility of the public. He also raised the question of surgical appliances. If it had not been for the Ministry of Health and the approved societies there would have been a first-class racket in some of these appliances.

Captain G. ELLISTON did not pretend to have wholehearted enthusiasm for this measure. The weakest point was the absence of any enforcement clause. Suggestions would be made in committee for the creation of an advisory controlling body for the registration and supervision of proprietary medicines. Sir DYMOKE WHITE said that a large body of retail pharmacists, including the National Pharmacists Union, was alarmed at many of the proposals. Sir FRANCIS FREMANTLE admitted that the bill did not go far enough because it did not compel disclosure of the quantities of the component parts, but he thought it was a step in the right direction. He spoke up for the B.M.A. which had done its best to run down the gross frauds and quackery in the patent medicine trade.

Miss F. HORSBRUGH, who replied for the ministry, promised consideration for the points raised. She agreed that this country needed a constructive health policy, but in order to build we had to demolish. The bill was read a second time.

The Seaman's Diet

In the House of Lords on July 8 the Earl of CORK and ORRERY made a further plea for equal rights for merchant seamen when in hospital. He explained that he was not alluding to medical treatment but to diet. For instance, the Royal naval rating received 2¾ lb. of meat in a week, whereas the merchant seaman only got a shilling's worth, or less than 1 lb.; the naval rating got 10½ oz. of butter, the merchant seaman 6 oz.; the naval rating got 1 lb. 8 oz. of sugar and the merchant seaman 8 oz.; the naval rating got 9 oz. of bacon and the merchant seaman 4 oz. When he raised this matter about six weeks ago[1] Lord Croft had stated that the Government were satisfied that both classes of patient were getting the food current supplies allowed and their medical condition required. But in view of these figures one could only think that one class of man was getting too much or the other too little. Lord Cork and Orrery quoted from a letter written by a physician who gave up his spare time to caring for sailors of the merchant marine. The doctor wrote that during the past year it had become increasingly clear that extra food allowances were highly desirable in the Seamen's Hospital since many of the patients were admitted in a debilitated state after long voyages or prolonged exposure in open boats. No small number of the conditions which the hospital was called upon to treat were the outcome of faulty and deficient diet on board ship. The doctor added that there was no doubt that the increased dietary offered by Service hospital rations would enable physicians and surgeons to get their sailor patients back into service more quickly.

Lord WOOLTON said that six weeks ago an alteration was made in merchant seamen's rations and now except for meat the two Services were treated alike. In hospital the rations went into a common pool and each man got what was necessary for him according to the opinion of his medical attendant. If there was any shortage of food for merchant seamen, or for any other class of seamen, who were being treated in hospitals, he promised to see it put right. But he had received no complaints. But in deference to Lord Cork and Orrery he had referred the amount of food used in hospitals treating merchant seamen once more to the Medical Research Council for advice as to whether the dietary was sufficient, and if in the opinion of the council the dietary was not sufficient he would at once increase it. But if he was advised that it was not necessary he hoped that Lord Cork and Orrery would be satisfied. The Earl of Cork and Orrery thanked Lord Woolton for his sympathetic reply, but said that he could not agree with him, for as vice-chairman of the Seamen's Hospital Society he had received the dietary figures which he had quoted that morning from the secretary. The society had five hospitals and two convalescent homes and the information of the alteration given by Lord Woolton had not reached those hospitals.

Extended Benefits

On July 10 in the House of Commons Mr. ERNEST BROWN, Minister of Health, introduced the National Health Insurance, Contributory Pensions and Workmen's Compensation Bill, a measure to increase the rates of sickness and disablement benefit and the rates of contribution payable under the acts relating to National Health Insurance, to extend the said acts to persons employed otherwise than by way of manual labour at a rate of remuneration exceeding £250 a year, and in connexion therewith to amend the acts relating to widows', orphans' and old age contributory pensions and certain other enactments; to enable any of the acts aforesaid to be adapted by regulations to war-time conditions; and to amend paragraph (*a*) of subsection (2) of section three of the Workmen's Compensation Act, 1925. The bill was read a first time.

QUESTION TIME

Orthopædic Treatment in Scotland

Mr. T. JOHNSTON replying to Dr. H. B. MORGAN said: I am aware that facilities for fracture treatment in Edinburgh and Glasgow are not generally in full accordance with the recommendations of the Delevingne committee but some progress has been made since the publication of the report. Moreover in developing the Emergency Hospital Services special attention has been given to arrangements for the treatment of fractures including the provision in Scotland of 6 entirely new orthopædic units (with associated provision for occupational therapy providing 2000 beds). These facilities are available not only for the treatment of civilian war casualties but also for certain manual workers whose early return to work is of special importance. As regards conditions which occasion crippling other than fractures I have encouraged schemes initiated by voluntary bodies for the improvement and extension of facilities for their treatment.

1. See *Lancet*, May 31, 1941, p. 710.

Venereal Disease in Jamaica

In reply to questions from Dr. MORGAN Mr. GEORGE HALL, Under Secretary of State for the Colonies, stated: There are different departments in the venereal diseases clinic at Kingston for males and females, but owing to lack of space and staff there are not separate departments for children. There are no special facilities in the hospitals for treating children suffering from these diseases and the great majority of infected children are treated at the clinic as outpatients. It is not the general rule for a child attending the clinic to be accompanied by an adult member of the family except on first visit. The Minister does not regard this position as satisfactory and he is taking up the whole matter with the Governor of Jamaica.

There are three clinics for the treatment of venereal diseases in Jamaica, situated at Kingston, Montego Bay and Port Antonio. Four full-time and two part-time medical officers are attached to the Kingston clinic and one part-time medical officer to each of the other two clinics. The governor states that it is impossible to estimate the proportion of those infected who seek treatment at the clinics. It is known, however, that an exceedingly small proportion of cases ever seek competent medical treatment in the early stage. The greater percentage only do so if late unpleasant complications develop. The following numbers of new cases were admitted to the clinics in 1940:

Kingston	Gonorrhœa	M.	2691	F.	4051
	Syphilis	M.	1624	F.	2190
Montego Bay	Gonorrhœa	M.	1056	F.	1104
	Syphilis	M.	504	F.	448
Port Antonio	Gonorrhœa	M.	800	F.	506
	Syphilis	M.	758	F.	489

M. = Male; F. = Female.

A temporary clinic at Kingston public hospital is equipped but is not in operation owing to the lack of staff. Clinics are also planned for Spanish Town, St. Anne's Bay, Falmouth, Savanna-La-Mar, Black River and Mandeville, when funds are available.

National Health Insurance Benefits

Mr. J. J. TINKER asked the Minister of Health if he was aware of the different rates of benefit paid by societies under the National Health Insurance scheme; and would he give consideration in the Bill he was to introduce to the pooling of all funds, so that one rate of benefit could be given to all insured persons.—Mr. BROWN replied: The answer to the first part of the question is Yes. The bill is designed to give effect to certain changes in the health insurance scheme necessary to meet war-time conditions, and the proposal referred to will doubtless be one of the issues to be considered by the committee which has been appointed by the Minister without Portfolio to undertake a comprehensive survey of the existing schemes of social insurance.

Alien Doctors

Mr. GEORGE STRAUSS asked the Minister whether he would extend the scheme whereby the services of doctors of allied and friendly nationality were employed in certain hospitals and institutions to cover those few doctors resident in Great Britain who had obtained their degrees in Switzerland, Sweden and other neutral countries.—Mr. BROWN replied: The question of making a further order under Defence Regulation 32B so as to include the classes of doctors referred to is receiving consideration.

Price and Delivery of Milk

Sir HENRY MORRIS-JONES asked the Parliamentary Secretary to the Ministry of Food why the producer of milk from best attested herds only received 1*s.* 4½*d.* per gallon, including cost of transport to wholesalers, whereas the retailer received 2*s.* 8*d.* per gallon.—Major G. LLOYD GEORGE replied: The return to the milk producer varies slightly according to the Milk Marketing Board region in which he is

situated. The retail price of milk also varies according to population areas. The figures quoted are substantially correct for North Wales for June, 1941. The retailer does not himself retain the difference between the price to the producer and the price to the consumer. He purchases his milk at the regional price which in June was 1*s.* 8½*d.* per gallon. Furthermore, the retailers' margin varies from month to month, being in England and Wales generally higher in the summer months than the winter months; while the return to the producer is higher in the winter than the summer. It is therefore misleading to base any comparison of producers' and retailers' earnings on the figures of any particular month.

In answer to a further question Major LLOYD-GEORGE stated: While the practice of restricting milk deliveries to six days a week is substantially less prevalent than a month ago, there are still towns and villages where a milkless day operates. The Minister has appealed to distributors to maintain a 7-day delivery service in the interest of the consumer. The great majority of distributors has responded to this appeal. Consideration is being given to the further action which might be taken in those centres where the appeal has so far proved fruitless.

Occupational Therapy in Mental Hospitals

Mr. F. MESSER asked the Minister of Health if he was aware that the present rationing of materials is hindering the work of occupational therapy in mental hospitals; and if he could take steps to secure a relaxation of the rationing regulations in these special cases.—Mr. BROWN replied: I am in communication with the President of the Board of Trade in this matter.

Letters to the Editor

SAVING ON DRUGS

SIR,—Arising out of Dr. Pappworth's letter on this important subject in your issue of July 5, it may be of interest to set out what has been done in the hospitals of the London County Council. The purchase of drugs by contract and otherwise is in the hands of experts on the staff of the chief officer of supplies: they advised me in April, 1940, that there was actual and potential shortage of many drugs and I forthwith established a committee of hospital medical officers and pharmacists to revise our pharmacopœia and drug schedules. On June 4, 1940, a circular, from which the following are extracts, was issued to all hospitals with, as is our routine practice, a copy to each pharmacist:—

"... Considerable difficulty is being experienced at the present moment in obtaining supplies of drugs, medicines, etc., required for the treatment of patients in the Council's hospitals owing to the war and to difficulties in overseas transport.

The questions whether various kinds of drugs could be reduced in number or adequate substitutes found have been very carefully considered and a statement is attached which contains suggestions whereby such economies can be secured. The question of transport not only affects drugs from overseas but affects also the distribution of drugs from the firms supplying them, owing to the restriction of petrol supplies, and it is imperative as far as possible to restrict the number of deliveries. . . .

"In the schedule which is attached it is recommended that certain articles should be issued only for use in particular kinds of wards, e.g., tuberculosis wards, and it is hoped that you will ensure that this request is carried out to its fullest extent.

With regard to the use of proprietary medicines, every effort should be made to restrict their use and British substitutes of official preparations and reputed analogous therapeutic effect should be used where possible. I attach for your information and for that of the pharmacist, a handbook entitled Pharmaceutical Specialities, issued by the Association of British Chemical Manufacturers. . . .

"Your special attention is also drawn to the fact that both olive oil and glycerine are controlled and that the amounts available are severely restricted. Both must be used as sparingly as possible. . . .

"It is also suggested on the grounds of economy that all the developing and fixing solutions for use in the X-ray department or cardiographic department, if any, should be made at the hospital. . . ."

The schedule attached to this letter comprised 86 drugs or preparations. Since that date several other circulars have been issued drawing attention to shortage or unavailability of other drugs and copies of all recommendations as to the use of drugs, &c., emanating from the Ministry of Health or the M.R.C. have been sent to all medical superintendents and pharmacists. Careful scrutiny of drug requisitions is maintained at head office and, as it is only rarely that deletion or substitution is called for, I am satisfied that in the L.C.C hospital service the desire to economise, which Dr. Pappworth rightly insists on, undoubtedly exists and is loyally acted upon.

County Hall S.E.1. W. ALLEN DALEY, Medical Officer of Health.

SHORT ŒSOPHAGUS AND PEPTIC ULCER OF THE ŒSOPHAGUS

SIR,—In your issue of July 5 you refer to a communication Dr. P. J. Briggs, Dr. R. C. S. Dick and I made before the medical section of the R.S.M. in 1939 (*Proc. R. Soc. Med.* 1939, **32**, 1423), in which we stated that peptic ulcer of the œsophagus is almost always associated with that form of hernia of the upper part of the stomach through the diaphragm which is caused by congenital shortening of the œsophagus. According to your annotation Dr. A. S. Johnstone has recently described 7 cases of chronic œsophageal ulcer, in all of which there was definite shortening of the œsophagus. He regards the short œsophagus as secondary to cicatricial contraction of the ulcer, and not, as we maintained, the predisposing cause. The main reason for this appears to be that in his experience œsophageal ulcers occur at an advanced age, the average in his series being 64, as symptoms might be expected to develop much earlier if the condition were associated with a congenital abnormality. But the age at the onset of symptoms in our 7 cases of chronic peptic ulcer in a short œsophagus varied between 18 and 58, the average being 41. In the only case we have found in the literature the shortening was obviously congenital, as the patient was only three years old and vomiting of blood-stained material had begun at the age of one week (Haroen, I. L. and Gerlings, P. G. *Acta oto-laryng., Stockh.* 1934, **19**, 461).

We believe that a short œsophagus predisposes to the development of a peptic ulcer because for some unknown reason the cardiac sphincter is incompetent when the œsophagus is congenitally short, whether an ulcer is present or not. Opaque fluid can be seen with the X rays to regurgitate into the œsophagus from the stomach on lying down, whereas no such regurgitation occurs under normal conditions. Consequently acid gastric juice is likely to enter the lower end of a congenitally short œsophagus at night and produce erosions, which may develop into chronic ulcers. Owing to this regurgitation most patients with chronic œsophageal ulcers experience pain behind the lower end of the sternum immediately they lie down at night as well as while eating, and healing is hastened and recurrence prevented by having the head of the bed permanently raised on blocks.

Oxford. ARTHUR HURST.

THE FRONTAL LOBES

SIR,—I wondered how long it would be before the erstwhile insulin, Cardiazol and electrocution enthusiasts, having become tired of inflicting minor injuries on the cerebrum, got wind of the new whole-hogging technique and dashed in, with careless rapture, to the mutilation of the frontal lobes. I take it that their former adventures will now be allowed to sink into respectable oblivion.

Lest in what follows I should be accused of having allowed my emotions to run away with my reason I should like to point out that the new procedure consists in inflicting severe injury on a part of the brain the function of which has not yet been precisely determined, in order to cure disorders of the cause of which we are largely ignorant. Not that I am so much against empirical procedures of this kind provided that the work is done well and scientifically, which means the selection of a special type of mental disorder for investigation, the accumulation of an adequate number of such cases before publication, accurate and detailed psychological assessment before and after treatment, and careful

observation of the behaviour of individual personalities—if this term be still appropriate—for a reasonable period of time after they have left hospital. Your contributors of July 5 did not do this. The desire to be the first in Britain to rush into print must provide their principal excuse, since such pioneer work has already been carried out abroad on a larger scale by Moniz, Freeman and others. One fact clearly emerges: the new procedure injures severely the frontal lobes, a part of the brain which giants of the past such as Ferrier, Hitzig, Flechsig and Bianchi—to name but a few at random—considered to be of the greatest functional importance in the higher mammals; an opinion which is supported by thorough and careful workers of today like German, Jacobsen, Brickner and Rylander. Incidentally Jacobsen has provided evidence of the specificity of function of the prefrontal lobes, so that it is unlikely that their function can be taken over by other cerebral areas after their liquidation.

If, then, the frontal lobes be an essential part of the highest mental level, derangement of which, as Hughlings Jackson long ago suggested, is the first stage of dissolution in mental disorder, it is evident that any benefit derived from their destruction is at the expense of certain mental functions, attributes and potentialities which can never be restored. The frontal lobes in such cases must still have been functioning in some fashion intermediate between normality and complete failure, because no benefit accrues from the destruction of centres which have already ceased to function. The "cured" individual has dropped a rung on the evolutionary ladder. I am not denying that such descent may seem a desirable alternative to incurable mental disorder. Indeed, in a well-organised world of the future a new subhuman species may have its uses as hewers of wood and drawers of water. Moreover, in certain individuals this highest level may never have been well developed and so its loss will not be severely felt. I must, however, beseech the leucotomy experts to hold their hand as long as possible in dealing with mental patients formerly of great intellectual strength, delicate and sensitive minds or high moral or spiritual attributes, and be content to assist Nature's well-tried healing powers.

Finally the employment of this method in the neuroses appears to me to be absolutely indefensible and can only be regarded as a measure of the lack of human sympathy and understanding and psychotherapeutic insufficiency of those who carry it out.

Friern Hospital, N.11. C. R. BIRNIE.

FUTURE OF GENERAL PRACTICE

SIR,—I am glad to have the assurance of Sir Farquhar Buzzard that I have misunderstood the principles of the Nuffield Trust, but the probable effect which the proposed changes will have on the lives of the patients and doctors of the future is a matter on which opinions are likely to differ, and after reading once again the article on the work of the trust in THE LANCET for Feb. 1 I am still not convinced that it will be an organisation which will "come back to the individual man, be quickened by the individual life and respect individual autonomy to the fullest possible extent."

In terms of practical administration the point at issue resolves into the degree to which centralisation should be carried out in the hospital service, in the interest of the patients served and of the doctors supplying the service. The Nuffield Trust proposes a form of organisation in which there will be a small number of very highly specialised and efficient hospitals working in association with a large number of other hospitals of inferior status. I suggest that it would be a better plan to have a large number of general hospitals of approximately equal standing scattered throughout the country. Is there any good reason why Bangor, for instance, should not have a good general hospital? It is the seat of a University College and the cultural and business centre for the counties of Caernarvon and Anglesey with a population of nearly 200,000 people. This population should support a hospital of 1000 beds. There might be a similar hospital at Wrexham or some other convenient town in North Wales. It will be objected that there are not enough men of consultant rank to staff such hospitals. If this is true at present it is because of the unorganised state of postgraduate instruction. It is not due to any lack of natural ability in the doctors. No doubt much of the medical work done in England and Wales falls short of the best standards. This is a condition which we hope to remedy. Much of the bad surgery occurs because men with natural aptitude have not had adequate training in their special subject while men lacking in natural talent have had economic advantages in early life which have enabled them to enter the ranks of the consultants. With a rational and correlated system of postgraduate teaching, including opportunities for practical work under graduated supervision, there would be no difficulty in training up a body of consultants large enough for all the needs of the community. It is my opinion that the scheme of the Nuffield Trust will not produce such a desirable result.

It is perhaps only fair to point out that although the plan I have indicated would give enormously increased opportunities to the general body of the members of our profession it would reduce the monopoly value of the services of the consultants and specialists.

Liverpool. HENRY H. MACWILLIAM.

VILLAGE SETTLEMENTS IN WAR-TIME

SIR,—There were some who at the outbreak of war thought that the entire fabric of village settlement organisation would fall to the ground owing to the impracticability of selling products in days when government requirements must take first place. Export markets for goods—a prominent feature of prewar Papworth and Preston Hall—would certainly be eliminated to a large extent, and the question at once arose: Could the modern village settlements survive in a period when luxury articles and the staple products of the industries could be manufactured only by government permits? If not, the only course would be for these institutions to close down for the period of the war and endeavour to accommodate settlers in work in the near neighbourhood of the villages.

War was in itself a challenge to village settlements to rearrange and reorganise themselves to meet new conditions. The ways and means by which the many difficulties have been overcome cannot be detailed here, but it can be said with truth that the industrial sections at both Papworth and Preston Hall have never been busier at any previous time in their history. The change has indeed been remarkable. The turnover at Preston Hall has more than doubled in just over fifteen months, and, by the simple expedient of acquiring more machinery and erecting more buildings and employing more outside workers, the turnover could be increased to four or five times that of the peace-time figure of £100,000 or so a year.

Obviously it has been impossible to increase the volume of work done without healthy labour being called upon to help, for the extra labour could not possibly be recruited and trained entirely from the tuberculous population passing through the institutions. At Preston Hall outside labour has been called in, but only to a limited degree, and my object in reporting on the present position of village settlements is to issue a warning in this very direction. If the village settlement conception is to remain, there must be a limit to the number of outside healthy people employed in industries the tempo of which is adjusted to the needs of the tuberculous patients. The tendency to expand the purely industrial aspect of the settlement must never be allowed to prejudice the main function of the settlement itself, which is the care and treatment of the tuberculous. Once the balance of man-power has passed from the tuberculous to the healthy, then all the most valuable attributes of the tuberculosis settlement disappear. Adherence to this principle may have limited the industrial turnover at Preston Hall, but it has preserved the integrity of a scheme which has been successful for the past fifteen years.

My fear is that in an attempt to produce goods and to increase industrial income the very scheme which has taken so many years to build up may be sabotaged. Let there be growth, but let the growth be in accordance with the principles laid down by the late director and founder of Papworth, by the reports of the employment committee of the Joint Tuberculosis Council and by others who have studied such schemes from their inception. If, however, the industrial mechanism of settlements has worked smoothly during the war, there

have been special problems in other directions to solve. At the outbreak of hostilities only one of the better-known settlements was requisitioned, in part at least, by the Emergency Medical Service. Its geographical position near Maidstone made Preston Hall an early choice for the reception and treatment of potential casualties, and in the early days of September, 1939, a beginning was made in the erection of new hutments which are now familiar throughout the country. Within six months the huts were completed and the first patients admitted. Side by side with the reception of civilian and Service patients the sanatorium section of the hospital—though greatly curtailed in the number of beds available—continued to function, and no administrative difficulties have been experienced.

The association of a general hospital cheek by jowl with a sanatorium is something new in medical organisation in this country, and here again experience has shown that there is nothing incompatible in the association. The routine of the village settlement has not been interfered with in any way. The presence of a general hospital in the grounds of Preston Hall has, in fact, done something to awake again in some of us a conscience in general medicine and surgery which a lifetime devoted to tuberculosis is apt to destroy, and I believe I am speaking with the authority of my colleagues on the E.M.S. staff when I say that they too have come to regard tuberculosis as a wider and more varied subject than they had never kown. And that the two staffs can coöperate in the fullest measure was proved during the dark days following the evacuation of Dunkirk.

J. B. MCDOUGALL,
Medical Director.

Preston Hall, Kent.

McARTHUR HERNIOPLASTY

SIR,—May I be allowed to join issue with Squadron-Leader McLaughlin (*Lancet*, July 5, p. 11) on the value of the McArthur operation for inguinal hernia which he describes and practises as a routine procedure? I have used it in selected cases in the past nine years as a compromise between the Bassini and the Gallie operations, but I find the indications becoming less frequent. I do not agree that the anatomy of the inguinal canal is not disturbed by this procedure. In fact, in order to make the short strip of fascia last until the internal ring is reached there is a temptation to pull firmly on each stitch, and the distortion thereby produced is often more marked than in the Bassini operation. Certainly Gallie did not intend fascial strips to be used in this way, but to be darned loosely over the gap.

In young active patients, such as those with whom Squadron-Leader McLaughlin is dealing, the musculo-aponeurotic arch which surgeons call the conjoined tendon is well developed except where the hernia is unusually large. Any suturing of this muscle, whether with catgut, silk or fascia, must cause it to atrophy. I have seen a direct hernia actually produced in this way where no hernia previously existed, the surgeon believing that he was "strengthening" the inguinal canal by a few Bassini sutures. In this type of patient, Kocher's operation, in which the sac is invaginated into itself and brought out near the anterior superior iliac spine, is undoubtedly the best, because it is based on a physiological conception and strictly respectsthe conjoined tendon. The second step of the operation is important and significant. The sutures which reef the external oblique aponeurosis from above downwards narrow the inguinal canal, thus relaxing and splinting the stretched muscular fibres of the conjoined tendon in the same way as a shoulder abduction splint relaxes a paralysed deltoid. The operation is a simple one and should take no longer than ten minutes. It was taught to me by Mr. J. H. Rawlinson, of the Northern Hospital, Liverpool, about nine years ago, and since then I have used it 288 times in 680 inguinal hernias with increasing confidence and without modifying it in any detail.

Nor can I support Squadron-Leader McLaughlin's claim that the McArthur operation permits the patient to return to full duty in five weeks. In dock labourers this practice would be disastrous. The longer the patient abstains from heavy work the better, whatever the operation, and a great deal of disability will be avoided if the surgeon insists on this point.

J. A. MARTINEZ.

Weaverham, Cheshire.

SUPPRESSION OF URINE IN CRUSH ŒDEMA

SIR,—The appearance among air-raid casualties of this syndrome—crush œdema followed by suppression of urine—stimulates one to survey all the conditions which are in any way comparable in the hope of finding some guide in treatment. The paper by Mr. Patey and Dr. Robertson in THE LANCET of June 21, in which it is suggested that the symptoms may be mitigated by controlling the leak of fluid which takes place suddenly out of the circulation into the injured limb, brings to mind work which was done many years ago by A. W. Sellards on Asiatic cholera in Manila (Principles of Acidosis. Harvard Press, 1917). Sellards describes the suppression of urine which occurs in cholera when the patient collapses because of the huge effusion of fluid from the circulation into the intestine. This suppression is associated with acidosis and he found that large doses of bicarbonate given intravenously was the most useful form of therapy. He emphasised that this treatment should be started as soon as possible in the early stages of collapse in cholera, but found that it was possible sometimes to restart the secretion of urine by intravenous bicarbonate even when suppression had been present for two days. He indicated that it was advisable to include calcium in the solution but necessary to avoid an excess of sodium. He laid stress on the importance of noting the reaction of the urine frequently, as it was not permissible to use massive injections of alkali intravenously after the urine had become alkaline.

H. RUSSELL.

Edinburgh.

ENTEROBIUS AND EXCRETA

SIR,—Threadworm infestation appears to be on the increase in this country. In your issue of Dec. 28, 1940, Sir Philip Manson-Bahr recommended phenothiazine in doses of 4 g. or more daily, and diphenan (B.D.H.) is held to prevent the reproductive cycle of the parasite. In China the disease is widespread, through the insanitary habits of the people, who save their excreta in Shanghai jars, mix them with water, and bail out the infected contents on the vegetables in their gardens. Recent reports of numerous infestations in this district led me to make enquiries among the smallholders, and in one morning I spoke to two lettuce growers, who admitted following the Chinese practice with small modifications. I hope local health officers will take note.

W. BRYCE ORME,
Late P.M.O., Johore.

Hove.

PAIN IN ACUTE APPENDICITIS

SIR,—Mr. Ruscoe Clarke and Mr. Shapiro have done well to call attention to the indubitable fact that pain is not invariably the first symptom in cases of appendicitis. It is encouraging to find the rising school of clinicians testing and qualifying the dogmatic statements of former teachers. Nevertheless the fact that pain is generally the first symptom of appendicitis still holds good, and it is probable that those who first taught this merely overemphasised the fact in order to call attention to its great importance.

V. ZACHARY COPE.

London, W.1.

ST. JOHN OPHTHALMIC HOSPITAL, JERUSALEM.—The report of this hospital for 1940 shows that work, despite war conditions, was heavier than ever. There were 926 inpatients, an increase of 234 over the previous year, and almost 200,000 attendances in the outpatients department. The work on the new south block has been proceeding satisfactorily, and the Order of St. John has offered it to the government of Palestine for the duration of the war to be used as a civilian-casualty hospital.

SERVICE CASUALTIES.—Surgeon Lieutenant Duncan Lorimer, M.B. Edin., R.N.V.R., H.M.S. *Jersey*, and P/T/Surgeon Lieutenant A. K. Beardshaw, M.B. Sheff., R.N.V.R., H.M.S. Yacht *Fiong* are reported missing, presumed killed.—Lieutenant R. M. Solomon, M.R.C.S., R.A.M.C., has been posted as missing, believed prisoner of war.

SOVIET WAR SURGERY.—On Friday, July 25, at 7.30 P.M., at 11, Chandos Street, London, W.1, Dr. Janet Vaughan and Mr. Ruscoe Clarke will speak on Some Soviet Contributions to War Surgery. Invitation cards may be had from the Society for Cultural Relations with the U.S.S.R., 98, Gower Street, W.C.1.

Obituary

WILLIAM HENRY WILLCOX

K.C.I.E., C.B., C.M.G., M.D. LOND., F.R.C.P., F.I.C.

THE passing of Sir William Willcox on July 8 leaves a gap in medicine which will be difficult to fill. Trained first as a chemist and later in medicine, he used his double qualification to advance clinical medicine and to make contact with its sister professions. Having taken the London B.Sc. in 1892 he entered St. Mary's three years later with a natural science scholarship, qualifying M.B. with gold medal in forensic medicine and other honours in 1900. Then followed a period of struggle for he had little private means and no influential backing, but he made ends meet by private coaching and a lectureship in chemistry until in 1907 he was elected to the staff as outpatient physician. About this time A. P. Luff resigned his appointment as junior analyst to the Home Office and Willcox succeeded him, working with Sir Thomas Stevenson and on his death succeeding to the senior position. He handled with success many *causes célèbres*, and by his brilliant identification of hyoscine in mortal remains preserved, by the murderer's fatal slip, with quicklime was instrumental with Sir Bernard Spilsbury in bringing "Dr." Crippen to justice. In the early part of the last war he was sent to Mudros where typhoid and dysentery had befallen the casualties from Gallipoli, and later went to Mesopotamia as consulting physician to the Forces with the temporary rank of colonel, when his services in combating scurvy and beriberi were recognised with high distinctions. Returning to London after the war he reluctantly gave up his Home Office appointment and devoted himself more to clinical medicine. From 1919 to 1935 he was physician to St. Mary's and enjoyed a large consulting practice. But the Home Office retained him as medical adviser until his death. The wealth of his knowledge and experience was revealed in his study of toxic jaundice embodied in the Lumleian lectures of 1931 published in our columns, and in the rheumatic affections he became a recognised authority.

Walter Stoneman

Willcox was slow of speech and thought. He never made a step forward until he was sure that the foundations were well and truly laid. Those who did not know him were apt to underrate his ability until they found themselves caught out by it. He did everything which lay in his power for the hospital he loved and for generations of its students, many of whom he helped in a tight corner. In the early years of the century when the medical school was not yet financially prosperous he gave much of his time to teaching, holding lectureships in chemistry, physics, hygiene, forensic medicine and chemical pathology, and later in medicine. He was a regular attender at meetings and committees of a number of learned societies, over four of which he was elected to preside; discussion always interested him and he never spoke without careful preparation of his subject. In 1935–36 he was master of the Society of Apothecaries. Slow to form opinions he stuck to them when reached with the tenacity of honest conviction. Those who did not share his views admitted their genuine quality and agreed that "Wilks" was a prodigious worker. An hour after midnight was the best time to catch him on the phone, but he was to be seen riding in the Park before breakfast. This was his recreation and he was never happier than with his horses or on the hunting field. He liked dining out and was hospitable at home. He was just the same to rich and poor and was beloved by the sisters and nurses of his wards.

Sir William Willcox was the son of William Willcox of Melton Mowbray. He married Mildred, eldest daughter of W. Griffin of Clapton, Northants, and leaves his widow with three sons and a daughter.

FRANK GEORGE LAYTON

M.R.C.S., J.P.

THROUGH the death of Dr. F. G. Layton on July 3, Walsall has lost a citizen and a doctor. His working life was spent in and about back streets, and long before it began he wandered in and out of the homes of the poor with his father who was essentially a poor man's parson. Born at Hounslow in 1872 he was educated at King's College School and qualified from St. Thomas's Hospital in 1894. House-appointments at St. Thomas's, the Brompton, and Great Ormond Street gave him a good general background before he went as assistant surgeon to Walsall General Hospital. He remained to practise medicine and humanity in the town, and became honorary physician to the hospital, town councillor and magistrate. He felt keenly the civic responsibilities of the doctor and he was sure that the doctor's training, experience and knowledge of men and women were badly needed in the council chamber and the court-room. Dr. Layton's record of service shows that he practised what he preached and some of his most valuable work was done as chairman of the juvenile court. His life was never leisured yet he always found time for the things he wanted to do, and writing was one of them. "Dr. Grey" was published in 1911, "Sable and Motley," "The Old Doctor," and "Behind the Night Bell" were among the novels that followed. These shrewd commentaries, full of lively dialogue, described the life of a panel practitioner. Though the author emerges as a lovable character the description would probably have displeased him. He also wrote several plays. Miss Horniman produced "The Parish Pump" in London, Manchester and Birmingham, and his most successful play for children was called "The Land of Make Believe."

EDMUND TYTLER BURKE

D.S.O., M.B. GLASG.; LIEUT.-COLONEL R.A.M.C. (RETD.)

News of the death on June 14 of Colonel Burke will cause much regret in the wide circle of those at home and abroad who knew him through his vigorous writings on venereal diseases, and has come as a shock to his friends in the North and in London, including both students and postgraduates, who benefited from his teaching. These will remember him for his easy friendliness, his enthusiasm, and for the encouragement he gave to all who sought his advice. His views, expressed with clarity and vigour, on certain neglected aspects of his subject led at times to dissensions in which he proved a doughty opponent and more than able to hold his own. Unfortunately, in later years, his activities were restricted by failing health and he was obliged in March last to resign his appointment as director of the Whitechapel Clinic. But he had been able to complete and publish a textbook embodying his great experience which should long remain a standard work.

Colonel Burke was the son of W. M. Burke, city chamberlain of Dundee. He was educated at Perth, St. Andrews and Glasgow, graduating in 1914 when he already held a commission in the R.A.M.C. (S.R.). He served in Gallipoli and Mesopotamia where he commanded the 40th field ambulance and was later A.D.M.S. North Persia. He left the Army in 1920 to become V.D. officer in Salford with a teaching appointment at Manchester University. Two years ago he came south

to take charge of a L.C.C. clinic, lecturing in venereology to London hospital students. He died at Paignton, Devon, in his 54th year.

OWEN EDWARD PENNEFATHER LLOYD

V.C., K.C.B., L.R.C.P.E.; MAJOR-GENERAL, R.A.M.C. RETD.

Sir Owen Lloyd died at St. Leonards-on-Sea on July 5 at the age of 87. The son of an Irish soldier, he was educated at Fermoy College and Queen's University, Cork. He took the Scottish conjoint qualification in 1877, was commissioned in the following year, and served in the Zulu campaign of 1879–81 and in the operations among the Kachin Hills in Burma in 1892–93. It was here that he won his Victoria Cross for bringing in a wounded brother officer under fire. The officer died and Lloyd took command of the fort which he successfully defended. He was medical officer to the Franco-British boundary commission on the Mekong river in 1894 and to the British Chinese boundary commission in 1898. His service abroad gave him unrivalled opportunity for sport and though he himself ate no meat he was a mighty hunter, in one year killing 150 head of big game including six tusker elephants. After further service at home and India Lloyd was created C.B. in 1910 and sent as principal medical officer to South Africa. He retired shortly before the outbreak of the last war with the rank of surgeon general, but he was quickly recalled in 1914 and appointed D.D.M.S. of the southern command. In 1923 he was promoted K.C.B. and from 1922 to 1924 he was a colonel commandant in the R.A.M.C.

ARCHIBALD THOMAS LEGGATE

M.A. CAMB., M.B. LPOOL; SURGEON LIEUTENANT, R.N.V.R.

Dr. A. T. Leggate was reported lost on active service, and the Admiralty have now intimated that he was killed by enemy action. He was last seen attending the wounded on the deck of his vessel—he went down with the ship. Archie Leggate, who was thirty years of age, was the third son of Dr. James Leggate of Liverpool, and his wife whom he married recently was formerly Dr. Joan Thomson. He was educated at Liverpool College, where he was a member of the first rugby and cricket teams. He was awarded many prizes and won a scholarship to Emmanuel College, Cambridge. His main interests were philosophy and history and he seemed destined for the Church. But the family tradition of medicine proved too strong, and after graduating at Cambridge he entered Liverpool University and qualified M.B. with distinction in surgery in 1937. After holding a house appointment at Liverpool Royal Infirmary, he helped in his father's practice and quickly became a conscientious and resourceful practitioner, who combined dignity and knowledge with good humour and understanding. It was doubtful whether he intended to stay in general practice for specialisation in psychiatry attracted him.

Burrell and Hardman, Liverpool

A friend writes: Archie Leggate had a wide range of interests—music, history, literature and the wild grandeur of the North-West Highlands. He had tremendous faith in man and in the ultimate triumph of truth and goodness. Essentially a man of peace, he became imbued with the courageous spirit of a crusader, and with conviction based on the highest Christian ideals he joined the R.N.V.R. at the outset of the war.

JAMES HUSSEY

M.D. LOND.

Dr. Hussey, who died at Farnham on July 4, was an outstanding figure of his year at St. Bartholomew's Hospital, both in ability and personality. His fellow-students recognised this by electing him president of the Abernethian Society. He qualified in 1896 and after being house-physician to Sir Dyce Duckworth he went into partnership at Farnham, where he proved himself to be of the best type of general practitioner. His skill and clinical insight were reinforced by a zest for his work, great kindness and sympathy. Small wonder that he became the trusted adviser of a large circle of patients, nor was his advice limited to medical matters, so wide was his interest in them. Up to his last illness he retained an almost boyish enthusiasm and looked much younger than his years. His striking presence will be greatly missed in the district in which he practised for more than forty years. His daughter Barbara qualified in medicine in 1938.

Medical News

University of Cambridge

At recent examinations for part II of the D.M.R.E. the following were successful:

Manfred Altmann, R. D. Caton, Arthur Elkeles, J. E. Glasgow, Grace M. Griffith, Max Halberstaedter and P. C. Phelps.

Royal College of Surgeons of England

At a meeting of the council held on July 4, with Sir Hugh Lett, the president, in the chair, Sir Alfred Webb-Johnson was elected president for the ensuing year, and Surgeon Rear-Admiral G. Gordon-Taylor and Mr. L. R. Braithwaite vice-presidents. The following were elected for the ensuing year:

Hunterian professors—Surgeon Rear-Admiral G. Gordon-Taylor, surgical anatomy of the lower end of the common bile-duct, and the adjacent head of the pancreas; Surgeon Rear-Admiral C. P. G. Wakeley, war burns; Lieut.-Colonel A. E. Hamerton, primary degeneration of the spinal cord in monkeys; Mr. W. Turner Warwick, growth of long bones; Prof. Francis Davies, conducting system of the vertebrate heart; Mr. Nehemiah Asherson, otogenic cerebellar abscess; Surgeon Commander E. R. P. Williams, blast injuries in warfare; Mr. Arnold Sorsby, ætiology of phlyctenular ophthalmia; Mr. Judson Chesterman, post-lobectomy collapse of the lung; Mr. F. W. Willway, surgery in mental disease; and Mr. D. N. Matthews, sulphanilamide and sulphathiazole applied locally to infected wounds and burns.

Arris and Gale Lecturers—Dr. John Beattie, physical and chemical changes in the blood associated with shock and hæmorrhage; and Dr. D. P. Cuthbertson, physiological reaction to injury—the post-shock metabolic response.

Erasmus Wilson Demonstrators—Mr. L. E. C. Norbury, Mr. Robert Davies-Colley, and Mr. C. E. Shattock.

Arnott Demonstrator—Dr. A. J. E. Cave.

Sir Frank Colyer was reappointed hon. curator of the odontological collection, and Mr. C. J. S. Thompson, hon. curator of the historical collection.

The Hallett prize, granted on the result of the primary examination for the fellowship, was awarded to S. Oleesky (University of Manchester) and a Loverhulme scholarship was granted to Miss H. B. Collard, B.A., for research on the change in blood-volume following hæmorrhage.

The following diplomas were granted, jointly with the Royal College of Physicians:

D.P.H.—C. A. Boucher, Maurice Coke, Nancie I. Faux, H. J. Griffiths, W. E. MacDougall, and H. C. Price.

D.P.M.—R. A. Blair, Edith M. Booth, E. W. Dunkley, A. M. Edwards, S. T. Hayward, J. H. Lowe, J. S. McGregor, Sigrid N. Pribram, W. A. M. Robinson, J. S. F. Sutton, and Mary E. E. Ward.

D.L.O.—D. A. Barley, N. L. Crabtree, O. C. Lord, and J. E. Rees.

University of Aberdeen

On July 10 the honorary degree of doctor of laws was conferred in absentia on Dr. A. W. Falconer, principal and vice-chancellor of the University of Cape Town. The following degrees and diplomas were also conferred:

M.B., Ch.B.—G. E. Swinney and A. R. Taylor (second-class honours); T. M. Allan, A. L. S. Anderson, Marie L. Anderson, J. B. Barnet, W. H. F. Boyd, A. A. Brockie, B. E. Brocks, J. L. D. Brown, John Bruce, N. B. Carmichael, Alison Clarke, A. M. W. Coburn, H. D. Collins, James Cramond, James Cran, Eunice M. Duncan-Brown, A. H. Dunnett, Marguerite N. L. Erskine, J. W. Gammie, A. G. Gibb, R. A. S. Gibb, Vera W. D. Hall, Helen D. Harkins, J. A. Harrow, G. A. M. Hendry, M. I. Hepburn, Thoma. Hunter, F. L. F. Innes, J. M. E. Jewers, P. O. Leggat, J. J. McNairn J. G. Matheson, R. F. Menzies, Peter Milne, W. H. P. Minto, R. G. Murray, Kevin O'Brien, John Slater, Alexander Stephen, Florence Stewart, W. D. Swinney, Pieter Theron, E. J. Valentine, S. W. Watson, R. A. S. Watt, Lily White, J. H. S. Whyte, Margaret O. Will, D. M. Williamson, L. A. Wilson, A. J. Witt, and J. F. Woolcott.

D.P.H.—William Lamb and J. A. F. McLean.

National University of Ireland

Mr. Denis Coffey has been reappointed representative of the university on the General Medical Council for three years.

Dr. W. J. O'Donovan, lecturer in the department o. pathology in University College, Cork, has been appointed to the chair of the department.

Medical Research Council of Ireland

The council has made a whole-time grant to Dr. Cecil Mushatt, and grants-in-aid to Dr. James Deeny, Mr. D. K. Malley and Mr. J. G. Waugh. The grants of Dr. T. E. T. Bradshaw and Prof. Hans Sachs have been renewed.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty held on July 7, with Mr. Roy Young, the president, in the chair, Dr. Archibald McPhater (Bowmore, Islay) and Dr. Herbert Pinkerton (Glasgow) were admitted to the fellowship.

Medical Honour

The M.B.E. has been awarded to Dr. L. F. Togneri, a ship's surgeon in the Merchant Navy.

Medical Society for the Study of Venereal Diseases

The annual general meeting of this society will be held on Saturday, July 26, at 2.15 P.M., at 11 Chandos Street, London, W.1. At 3 P.M., Colonel L. W. Harrison, the president, will open a discussion on the present trend of incidence of venereal diseases in England and Wales and the methods of control. Dr. Margaret Rorke, Lieut.-Colonel T. E. Osmond, Dr. Letitia Fairfield, Surgeon Commander David Duncan, Surgeon Lieutenant Genevieve Rewcastle, and Wing-Commander J. M. Kilpatrick will also speak.

London Chest Hospital

Lieut.-Colonel Henry Guest, M.P., presiding on July 8 at the annual meeting of this hospital, said that despite severe damage in recent air-raids the hospital had now been reopened for inpatients and all departments had resumed working. The building had begun of a new pathological department to replace the one that had been completely destroyed, burying records and specimens representing 90 years of research on chest affections.

Diphtheria Immunisation

The number of children under school-age who have been immunised against diphtheria remains dangerously low in all but a few districts of Scotland. The returns of inoculations received by the Department of Health show that efforts to secure the immunisation of children have so far been mainly concentrated on school-children. But as the age of maximal susceptibility to diphtheria is 1–4 years and case-mortality is then highest, the department have issued a circular urging that immunisation should be carried out as soon as possible after a child reaches the age 9–12 months. Inoculation at that age will practically ensure the child's safety until he enters school when a further inoculation is advisable. As most schools have now been closed for summer holidays local authorities are asked to direct the attention of their medical staffs and of general practitioners to the immunisation of the pre-school group of children. Every effort should be made to induce parents to bring forward young children for inoculation during the remaining summer weeks in order to safeguard them from attack by diphtheria during the winter.

In Birmingham Dr. H. P. Newsholme, the medical officer of health, lately told a press reporter that in the first six months of this year there were 600 accurate diagnoses of diphtheria in the city compared with 336 last year, and 56 deaths compared with 16 in the corresponding period of 1940. Dr. Vera Fellowes, assistant medical officer for diphtheria immunisation and maternity and child welfare in Birmingham, added "it is all so silly when immunisation is all that is needed and is so simple." To allow for the three months before it becomes effective immunisation should be done at once to safeguard children for next winter.

Lord Horder has been appointed personal adviser to the Minister of Food on medical aspects of food problems.

GLAXO Laboratories Ltd. inform us that 5 mg. and 25 mg. ampoules of their Berin injection (aneurine hydrochloride B.P.) will take the place of the 2 mg. and 10 mg. ampoules now in use, while 3 mg. Berin tablets as well as 1 mg. tablets will be available in future.

CORRIGENDA.—The annotation on page 46 of THE LANCET of July 12 gives the impression that sulphamidothiazole (Cibazol or Ciba 3714) is a new sulphonamide, whereas these are, of course, other names for sulphathiazole.—For "only 18 months having elapsed since the first operation was done" (*Lancet*, July 5, p. 7, col. 1, line 6) read "7 months."

Appointments

ORMEROD, F. C., M.D. Manc., F.R.C.S.: aural surgeon to the Westminster Hospital.
PHILLIPS, G. WHITE, M.D. Lpool, D.M.R.E.: radiologist at Whipps Cross Hospital, West Ham.
SIMPSON, ANNE, M.B. Aberd., D.P.H.: asst. M.O.H. for Ilford.

Births, Marriages and Deaths

BIRTHS

BEACH.—On July 8, at Oxford, the wife of Surgeon Commander W. V. Beach, R.N.—a daughter.
BOURDILLON.—On July 10, at Aylesbury, the wife of Flying-Officer J. F. Bourdillon, F.R.C.S.—a son.
CHARLES.—On July 10, at Bournemouth, the wife of Dr. G. Pendrill Charles—a son.
ELLIS.—On July 9, the wife of Mr. V. H. Ellis, F.R.C.S.—a son.
MALONE.—On July 8, at Cambridge, the wife of Captain Francis Malone, R.A.M.C. (prisoner of war)—a daughter.
MOCKLER.—On July 9, at Singapore, the wife of Surgeon Commander Edmund J. Mockler, R.N.—a daughter.
STURGEON.—On July 10, at Dunsford Place, Bath, the wife of Dr. Alec. W. Sturgeon—a son.
WARE.—On July 8, the wife of Captain Martin Ware, R.A.M.C.—a son.

MARRIAGES

DODDS—FANSHAWE.—On July 12, at Yeovilton, George Ridley Dodds, M.B., surgeon lieutenant, R.N.V.R., to Ann Renea Fanshawe.
GREENE—ASTON.—On July 12, in London, Alfred Charles Greene, M.B., to Joan Aston.
INGRAM—ASH.—On June 21, at Bournemouth, John Brewis Ingram, M.R.C.S., to Marjorie Yvonne Ash.
LANDON—CHARTER.—On July 12, at Shere, Surrey, Joseph John Landon, M.R.C.S., of Cambridge, to Dorothy Stella Charter, of Bethal, Transvaal.

DEATHS

EWART.—In June, by enemy action at sea, Archibald Robert Ewart, M.B. Dubl., surgeon commander, R.N.
GOODMAN.—On July 9, at Oxford, Roger Neville Goodman, M.D. Camb., D.P.H., aged 78.
LLOYD.—On July 7, at Haverfordwest, Perceval Allen Lloyd, F.R.C.S., aged 78.
PATERSON.—On July 6, at Cheltenham, Alexander Browning Paterson, M.B. Glasg.

Infectious Disease in England and Wales

WEEK ENDED JULY 5

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 787; whooping-cough, 5316; diphtheria, 794; paratyphoid, 140 (Stoke-on-Trent 40, Liverpool 21); typhoid, 46; measles (excluding rubella), 6524; pneumonia (primary or influenzal), 680; puerperal pyrexia, 159; cerebrospinal fever, 201 (County of London, 15; Manchester, 13; Birmingham and Sheffield, each 8); poliomyelitis, 12; polio-encephalitis, 2; encephalitis lethargica, 1; dysentery, 61; ophthalmia neonatorum, 73. No case of cholera, plague or typhus fever was notified during the week.

During the six weeks ended July 5 the cases of cerebrospinal fever notified in England and Wales numbered in successive weeks: 254, 244, 236, 211, 192 and 201. The course of the disease in the first half of 1941 has been similar to that in 1940 except that the initial rise this year was more gradual, and the maximum was about a third lower and occurred a week earlier. There were approximately 9183 notifications in the first half of 1940 and 7777 in the first half of 1941.

In Scotland in the six weeks ended July 5 the numbers have been 56, 47, 42, 50, 54 and 51. The maximum in 1940 was a week earlier, and in 1941 a week later, than in England and Wales. The numbers of notifications in the first half of 1940 were 1966, and 1661 in the corresponding period in 1941.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on July 2 was 1452; including scarlet fever, 160; diphtheria, 276; measles, 252; whooping-cough, 423; enteritis, 23; chicken-pox, 65; erysipelas, 34; mumps, 6; poliomyelitis, 1; dysentery, 3; cerebrospinal fever, 43; puerperal sepsis, 7; enteric fevers, 12; german measles, 9; other diseases (non-infectious), 65; not yet diagnosed, 73.

Deaths.—In 126 great towns there was no death from scarlet fever, 3 (0) from enteric fever, 28 (3) from whooping-cough, 5 (1) from measles, 25 (1) from diphtheria, 32 (2) from diarrhœa and enteritis under 2 years, and 6 (0) from influenza. The figures in parentheses are those for London itself.

Enfield, Willesden and Birmingham each reported a fatal case of enteric fever.

The number of stillbirths notified during the week was 208 (corresponding to a rate of 40 per thousand total births), including 18 in London.

VITAMIN THERAPY

A COMPREHENSIVE SERVICE FOR PHYSICIANS

There must be few members of the medical profession nowadays to whom Bemax is not quite well known. What may not be so well known is that the preparation of this vitamin food is but one of the numerous activities of its manufacturers, Vitamins Limited. Concerned, as they mostly are, with the development of vitamin therapy, their activities form a comprehensive service of which physicians are availing themselves increasingly.

Vitamins Limited here present in outline a general picture of these related activities in the belief and hope that the physician, more fully aware of their purpose and scope, may make the fullest use of the specialised services so placed at his disposal.

A WIDE RANGE OF VITAMIN SUPPLEMENTS

As its name implies, the primary function of Vitamins Limited is the preparation of pharmaceutical products designed to remedy some of the deficiencies in modern diet. Beginning with Bemax, which is the stabilised germ of wheat, the richest natural source of the vitamin B complex, the range of products has subsequently been extended. It now includes not only concentrations of individual vitamins, but also complete supplements containing all the vitamins and minerals usually deficient.

For example :—

BEFORTISS (Brand) Concentrated Vitamin B *Tablets.*—200 i.u. and 2 mg. per gm. For high dosage of the B complex. *Ampoules.*—2, 10 and 25 mg. For high vitamin B_1 dosage.

COMPLEVITE Tablets.—A multiple vitamin and mineral supplement. To make good the known deficiencies of vitamins and minerals in the average daily diet.

FERTILOL (Wheat germ oil) Capsules.—A highly active stable source of Vitamin E. For the treatment of habitual abortion, dietary sterility and certain neuro-muscular degenerations, etc.

PREGNAVITE Tablets.—A multiple vitamin and mineral supplement. Ensures an adequate supply of vitamins and minerals to meet the special requirements of pregnancy.

BEMAX.—Stabilised wheat embryo. The richest natural source of vitamins B_1, B_6, and E (320—420 i.u. B_1 per ounce).

From this descriptive list of the Company's products it will be seen that a wide variety of the material requirements for vitamin therapy can be supplied.

EXTENDING NUTRITIONAL KNOWLEDGE

Vitamins Limited desire to be of greater service than merely by supplying vitamin products. Information calculated to advance nutritional knowledge is collected and disseminated. Thus vitamin products can be put to the most efficient use in the service of medicine.

From the beginning, Vitamins Limited has maintained its own research Laboratories. Its staff maintains the highest standards in the Company's products, and contributes to modern work on vitamins and associated subjects.

This Research Department may be visited by appointment, and inquiries connected with any aspect of vitamin therapy are dealt with as fully as possible.

The development of nutritional knowledge is also promoted in other ways than by the research of the technical staff. No less important is the collection and collation of the latest findings of other research workers in this field all over the world. It is often of value to the practising physician to have such information—issued originally in many different scientific and professional publications—available in a compact and manageable form.

PREVENTION AS WELL AS CURE

Quite as important as the remedy of existing dietary deficiencies is the education of the public in the better choice and use of foods, so that everyone, including those at low income levels, may obtain from ordinary meals an improved intake of the protective factors. This aspect has not been overlooked. For example, the publications of the firm played an active part in popularising the improved Oslo Meal in Britain. In addition to the regular issue of nutrition information bulletins, two charts have recently been published showing graphically the values of all the common vegetables and fruits as sources of the various vitamins and minerals.

Copies of these charts will gladly be sent free to any doctor interested. Vitamins Limited will also be happy to supply descriptive literature and clinical samples of Complevite, Pregnavite, Bemax, Fertilol or Befortiss Tablets and Ampoules on request. Please state product(s) in which you are interested. Vitamins Ltd. (Dept. LXB), 23, Upper Mall, London, W.6.

Q.E.D.

Pasteur's theories were ridiculed, but his practical results were incontrovertible.

TODAY both theory and practice have been proved—and improved by scientific research.

Not least of the debts owed by humanity to this immortal scientist are the direct results of his discoveries—

ANTIVIRUS and BACTERIOPHAGE

THE ANTIPEOL PRODUCTS

ANTIPEOL OINTMENT
OPHTHALMO-ANTIPEOL
RHINO-ANTIPEOL
ANTIPEOL LIQUID

containing the antibodies (antivirus) of micro-organisms causing skin troubles, ocular, nasal, and aural infections

AND

ENTEROFAGOS

polyvalent oral bacteriophages of 140 pathogenic micro-organisms common to intestinal and para-intestinal infections (typhoid and paratyphoid fevers, dysentery, gastro-enteritis, colitis, diarrhœas, etc.)

EMBODY THE RESULTS OF CONSTANT SCIENTIFIC RESEARCH
CLINICAL SAMPLES WILL DEMONSTRATE THEIR EFFICACY

MEDICO-BIOLOGICAL LABORATORIES LTD.
CARGREEN ROAD, SOUTH NORWOOD, S.E.25

---

for MENOPAUSAL CONDITIONS

DESPITE RAPIDLY RISING COST OF OESTRIN

NO INCREASE IN PRICE

Recently there has been a considerable increase in the cost of the various ingredients in the Menopax formula. Oestrin, for instance, is now three times the price it was before the war. Nevertheless, Menopax will be maintained as long as possible at its original low prices.

Despite the war the Menopax formula remains unchanged and still contains Bromisovalerylurea (Bromuril), though this is unobtainable now in this country.

Clinical samples and literature will be gladly sent — post free — to any member of the medical profession on request

A Compound Oestrogenic Sedative

Menopax has now been firmly established as THE treatment for all symptoms of the Climacteric, and Doctors can prescribe it with every confidence. These tablets not only compensate for ovarial hormone deficiency but a high sedative effect is felt almost at once. The still reasonable cost permits these tablets to be freely prescribed.

MENOPAX

BRAND

TABLETS

An effective causal and symptomatic remedy for the treatment of climacteric disorders

EACH TABLET CONTAINS: Oestrin 100 I.U.; Ovarian Ext., 0·115 gr.; Theobromine Calc. Sal., ½ gr.; Caffeine Cit., ½ gr.; Monobromiso-Valerylcarbamide, 1 gr.; Calc. Lactate, 1½ gr.

42 TABLETS	75 TABLETS	168 TABLETS
2/6	5/-	10/-

Menopax in bulk for dispensing has been discontinued. It is now *only* obtainable through chemists.

(All prices plus purchase tax.)

PROPRIETORS: CLINICAL PRODUCTS, LIMITED, 2, THE GREEN, RICHMOND, SURREY

LESS SLEEP—MORE REST

To-day, you and your patients both need the BETTER SLEEP which BOURN-VITA gives

IN trying wartime conditions, even a small ration of deep sleep is the best restorative for tired bodies and nerves. Bourn-vita, the leading night food-drink, contains phosphorus, calcium and Vitamin B — all good for the nerves. Bourn-vita helps to induce a calm, *natural* sleep. Being readily digestible, it is specially recommended for convalescents.

NEEDS NO SUGAR

CADBURYS BOURN-VITA

FOR DEEP RESTORING SLEEP

LAXAROL

TABLETS

FOR THE PHYSIOLOGICAL TREATMENT OF CONSTIPATION

CONTAINING

BILIARY AND INTESTINAL SECRETIONS WITH
AGAR AGAR AND LACTIC FERMENTS

WILLOWS, FRANCIS, BUTLER & THOMPSON, LTD.

Telephone: CLISSOLD 6361 — 73, 75, and 89a, SHACKLEWELL LANE, LONDON, E.8 — Telegrams: "FORTY, HACK, LONDON"

"An After-Fitting Service to meet changing Aural Conditions"

OUR SERVICE TO DOCTORS AND THEIR DEAF PATIENTS!

IN prescribing "Ardente" for your deaf patients when an aid becomes necessary, you are safe because they can obtain service in most important towns throughout Great Britain—to meet any change in their aural condition. As an additional safety factor, each "Ardente" is covered by its maker's guarantee. There is a full range of "Ardente" types—electrical and non-electrical Bone-Conduction, Granule, Valve and Phantom types—which are individually suited, after Aurameter Test, to the needs of each case—no expense being incurred until hearing satisfactorily.

R.A. Dent
M. Inst. P. I.

Particulars gladly sent and Tests are made at Aurists, Doctors' patients, Hospital, or any of our addresses. Medical Press Reports are interesting.
10 Medals, 5 Diplomas. Supplied under National Health Insurance.

ARDENTE LTD.— 309 OXFORD STREET, LONDON, W.1
(Between Oxford Circus and Bond St.) 'Phones: Mayfair 1388/1718/0947

Birmingham Bristol Cardiff Exeter Glasgow Leeds Liverpool Manchester Newcastle

Respiratory Emergencies!

SPARKLET RESUSCITATOR

The 'Sparklet' Resuscitator has again and again proved invaluable in the Carbon Dioxide treatment of Respiratory Failure Emergencies.

CO_2 Snow Sticks!

POCKET CO_2 SNOW OUTFIT

With this outfit, CO_2 Snow Sticks are prepared in a few moments, and the treatment of skin blemishes made convenient and economical.

Write for special booklets to Dept. 60

SPARKLETS LIMITED
UPPER EDMONTON, LONDON, N.18.

WHEN PRESCRIBING CHLORODYNE
medical men should be particular to specify

Dr. J. Collis Browne's CHLORODYNE

The Original and only genuine Chlorodyne

used with unvarying success by the Medical Profession in all parts of the world for over 90 years.

Always insist on "Dr. Collis Browne's."

THERE IS NO SUBSTITUTE

Cheerfulness

When cheerfulness is in danger of disturbance, light a 'Player,' and with a few 'puffs' put trouble in its proper place. The friendly Sailor, as always, stands for cheery contentment and a guarantee that quality and purity remain unchanged.

KEEP THAT HAPPY EXPRESSION

Player's Please

M.C.C.5479

QUEEN

non-irritant Toilet Preparations specially for prescription in Allergic Cases

A complete range of toilet preparations entirely free from Orris in any of its forms or other irritants (B.M.J., Medical World, etc.). A safe alternative to suspected cosmetics. Through any Chemist or direct from BOUTALLS LTD., 150, Southampton Row, London, W.C.1.

Battley's Solutions

(as originally manufactured by Richard Battley)

Liq. Opii Sedativus (Battley)

The oldest and still the best hypnotic and sedative. Does not produce the unpleasant after-effects which often follow the administration of other opium preparations. It contains 1·8 % of Morphine. Usual dose—5 to 10 minims.

Liq. Cinchonæ Cordifoliæ (Battley)

Contains all the alkaloids of Yellow Cinchona Bark. A reliable preparation which does not deteriorate on keeping. Dose—2 to 15 minims.

Now manufactured and supplied by

Allen & Hanburys Ltd.,
37 Lombard Street, LONDON, E.C.3.

FOREIGN BOOKS
SPECIAL DEPARTMENT

ORDERS OR INQUIRIES PROMPTLY ATTENDED TO
Books not in stock obtained under Licence

H. K. LEWIS & Co. Ltd.
136 GOWER STREET
LONDON, W.C.1
TELEPHONE: EUSton 4282 (5 LINES)

MICROSCOPES!

A selection of fine instruments for sale at reasonable prices
ALSO MICROSCOPES WANTED FOR CASH
WALLACE HEATON LIMITED
127, NEW BOND ST., LONDON Phone: MAYfair 7511

PRELIMINARY EXAMINATIONS FOR MEDICAL AND DENTAL STUDENTS

The College of Preceptors holds Preliminary Examinations in March, June, September, and December. For regulations, apply to the Secretary, College of Preceptors, at temporary address, 31, Corkran-road, Surbiton, Surrey.

DIPLOMA IN PUBLIC HEALTH
THE ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE

The course of instruction can be commenced at any time. Candidates holding appointments are admitted to Part II Course as part-time students.
A prospectus and further particulars can be obtained from the Secretary. Telephone: Langham 2731-2.
28, Portland-place, London, W.1.

STAMMERING
SPEECH DEFECTS
RESIDENT AND NON-RESIDENT PUPILS.
Full Particulars upon request to:
Mr. A. C. SCHNELLE,
119, Bedford Court Mansions, London, W.C.1
MUSEUM 3665. Estab. 1905.

University of London King's College
AND THE UNIVERSITY OF BIRMINGHAM.

SEPTEMBER REVISION COURSES IN ANATOMY AND PHYSIOLOGY.

Subject to a sufficient number of applications, it is proposed to hold a three weeks' course in these subjects—more especially in preparation for the September 1st Conjoint Examination. The course will begin on MONDAY, 1ST SEPTEMBER, and will consist of daily lectures and demonstrations. Fee £4 4s. for each subject, plus College registration fee of 5s. Students desiring to enrol should write immediately to the SUB-DEAN AND TUTOR, King's College, at the Medical School, Birmingham, 15. Closing date for applications Wednesday, 30th July.

BRITISH POSTGRADUATE MEDICAL SCHOOL.
(UNIVERSITY OF LONDON.)

A PRACTICAL COURSE ON
OPERATIVE WAR SURGERY ON THE CADAVER
will be given by
MR. A. K. HENRY, M.B., M.Ch., F.R.C.S.,
consisting of six sessions.

The course will commence on the 11TH AUGUST at 2.30 P.M. and be held every afternoon during the week. On Saturday, the 16th August, the final session will commence at 10 A.M., and there will be no afternoon session.
The course is strictly limited to 16 students and is intended for Officers. Applications for admission should be made to the DEAN, British Postgraduate Medical School, Ducane-road, W.12.
The fee for the course will be five guineas, but no fee will be charged in the case of Officers of the Armed Forces who submit a leave certificate and register their names before the commencement of the course.

JENNER INSTITUTE Glycerinated VACCINE LYMPH

PREPARED IN ACCORDANCE WITH THE THERAPEUTIC SUBSTANCES REGULATIONS (BRITISH PRODUCT)

Telephone: BATTERSEA 1347.

SINGLE VACCINATION TUBES - - - 10d. each; 9s. dozen. Postage extra.
LARGE TUBES (EXPORT Only) sufficient for 5 vaccinations, 1s. 6d. each; 15s. dozen

SOLE AGENTS FOR SCLAVO'S ANTI-ANTHRAX SERUM.

Telegrams: "JENVACTER, PHONE, LONDON" (2 words).

JENNER INSTITUTE FOR CALF LYMPH LTD., 73, Church Road, Battersea, S.W.11.

BRITISH POSTGRADUATE MEDICAL SCHOOL

(UNIVERSITY OF LONDON)

WAR SURGERY OF NERVOUS SYSTEM
21st to 25th July, 1941

Monday, 21st July	10 A.M.	The Surgical Anatomy of the Skull and Brain.	Mr. G. C. Knight, F.R.C.S.
	10.30 A.M.	(*a*) Mechanism and Nature of the Injuries of the Skull.	Mr. G. C. Knight, F.R.C.S.
		(*b*) Mechanism and Nature of the Concomitant Injury to the Brain.	Mr. G. C. Knight, F.R.C.S.
	2 P.M.	Pathology of Wounds of the Nervous System.	Mr. G. C. Knight, F.R.C.S.
Tuesday, 22nd July	10 A.M.	(*a*) Closed Injuries of Skull and Brain: Their Complications and Management.	Mr. D. W. C. Northfield, M.S., F.R.C.S.
		(*b*) Immediate Treatment and Management of Wounds of Skull and Brain.	Mr. D. W. C. Northfield, M.S., F.R.C.S.
	2 P.M.	Demonstrations on the Cadaver of Operations on Skull and Brain.	Mr. A. K. Henry, F.R.C.S.
Wednesday, 23rd July	10 A.M.	Surgical Sequelæ of Wounds of Skull and Brain.	Mr. G. C. Knight, F.R.C.S.
	12.15 P.M.	Use of X-rays in the Diagnosis of Head Injuries.	Dr. J. Duncan White, M.B., Ch.B., D.M.R.E.
	2 P.M.	Disorders following Head Injuries.	Dr. J. Purdon Martin, M.D., F.R.C.P.
	3.15 P.M.	Hysterical Disorders Associated with War Wounds.	Dr. Aubrey Lewis, M.D., F.R.C.P.
Thursday, 24th July	10 A.M.	Some Sequelæ of War Wounds of Skull and Brain.	Mr. Harvey Jackson, F.R.C.S.
	12 NOON	Demonstration on the Cadaver of Operations on the Spine.	Mr. A. K. Henry, F.R.C.S.
	1.30 P.M.	X-rays in War Injuries of the Spine.	Dr. J. Duncan White, M.B., Ch.B., D.M.R.E.
	2 P.M.	War Injuries of the Spinal Cord.	Prof. Lambert Rogers, F.R.C.S., F.A.C.S., F.R.A.C.S.
Friday, 25th July	10 A.M.	War Injuries of the Peripheral Nerves: Diagnosis.	Prof. H. J. Seddon, D.M., F.R.C.S.
	11.30 A.M.	" " Treatment.	" " "
	2.15 P.M.	Possibilities of Nerve Grafting.	Mr. F. H. Bentley, F.R.C.S.
	3.15 P.M.	Care of Bladder in Injuries of the Nervous System.	Sir Alfred Webb-Johnson, C.B.E., D.S.O., F.R.C.S.

The fee for the Course is one guinea. Officers of the Armed Forces wishing to attend these lectures without payment of the fee should apply through their respective Director-Generals. Applications for tickets should be addressed to the DEAN, British Postgraduate Medical School, Ducane Road, W.12.

Further War Surgery Courses will commence as follows:—

OPERATIVE SURGERY IN WARTIME .. 11TH–22ND AUGUST.
WAR SURGERY OF THE EXTREMITIES .. 1ST SEPTEMBER.

St. Mary's Hospital Medical School,

W.2

(UNIVERSITY OF LONDON.)

PRIMARY F.R.C.S. COURSE.

A course of instruction for the December Examination will begin on TUESDAY, 16TH SEPTEMBER, 1941, in the following subjects:—

ANATOMY and EMBRYOLOGY.
PHYSIOLOGY and HISTOLOGY (with Practical classes).

Fee for the course £16 16s., or £9 9s. for either section separately.

For further particulars apply to the SCHOOL SECRETARY.

Royal College of Physicians of EDINBURGH.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.
ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

Copies of Regulations for the Triple Qualification (L.R.C.P.Ed., L.R.C.S.Ed., and L.R.F.P. & S.G.) and the Diploma in Public Health, containing dates of Professional Examinations for the year 1941–42 Curriculum, &c., may be had on application to THE REGISTRAR, Surgeons' Hall, 18, Nicolson-street, Edinburgh, 8, or to THE REGISTRAR, 242, St. Vincent-street, Glasgow, C.2.

Some Soviet Contributions to War SURGERY.

Papers by Dr. JANET VAUGHAN, D.M., F.R.C.P., and Mr. RUSCOE CLARKE, F.R.C.S. Chairman: Mr. ALECK W. BOURNE, F.R.C.S. Friday, 25th July, at 7.30 P.M., at the Medical Society of London, 11, Chandos-street, W.1. A limited number of invitations is available from the S.C.R., 98, Gower-street, W.C.1.

L. M. S. S. A.

FINAL EXAMINATION: SURGERY, August 11th, October 13th, November 10th; MEDICINE, August 18th, October 20th, November 17th; MIDWIFERY, August 19th, October 21st, November 18th.

For regulations apply REGISTRAR, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

THE MAGHULL HOMES FOR EPILEPTICS (INC.)

MAGHULL (Near Liverpool)

FARMING and OPEN AIR OCCUPATION for PATIENTS

A few vacancies in 1st and 2nd Class Houses.

FEES:
1st Class (men only) from £3 p.w. upwards.
2nd Class (men and women) 32/- p.w.

For further particulars apply Secretary,

C. EDGAR GRISEWOOD, A.C.A., 20 Exchange St. East, Liverpool

ROYAL EARLSWOOD INSTITUTION
REDHILL, SURREY

For MENTAL DEFECTIVES of all ages

Training under medical supervision. Schools, Farm, Trade Workshops, Recreations. Fees £110 to £375 p.a. Election by votes of subscribers at reduced terms for necessitous trainable cases.

Apply, Secretary. Tel.: Redhill 344

HEIGHAM HALL, NORWICH

PRIVATE MENTAL HOME for Nervous and Mental Illness. All forms of treatment available. Fees from 4 gns. per week upwards according to requirements. Vacancies occasionally exist at reduced fees on the recommendation of the patient's own physician.

Apply to Dr. J. A. SMALL. Telephone: Norwich 80.

THE COPPICE, NOTTINGHAM.

HOSPITAL FOR MENTAL DISEASES.
President: The Right Hon. LORD BELPER.

This Institution is exclusively for the reception of a limited number of PRIVATE PATIENTS of both sexes, of the UPPER and MIDDLE CLASSES, at moderate rates of payment. It is beautifully situated in its own grounds, on an eminence a short distance from Nottingham, and commands an extensive view of the surrounding country; and from its singularly healthy position and comfortable arrangements affords every facility for the relief and cure of those mentally afflicted. Voluntary and Temporary Patients received. Occupational Therapy. For terms, &c., apply to the Medical Superintendent.

Telephone: 64177 Nottingham.

MENTAL NURSES
Also Fully Trained Nurses for
MEDICAL, SURGICAL,
45, BEAUMONT ST., W.1
'Phone: "WELBECK 6066"

MALE & FEMALE TRAINED — THE TEMPERANCE — NURSES CO-OPERATION
ESTABLISHED AT THIS ADDRESS 44 YEARS

MALE & FEMALE
all Cases, Male, Female, & Children
MATERNITY, FEVER, etc.
H. S. STURGESS, Secy.
'Grams: "ABSTAIN, LONDON"

Telephone: WELbeck 2728 Telegrams: "ASSISTIANO, LONDON"
For MEDICAL, SURGICAL, and
MENTAL NURSES
Male or Female
THE NURSES' ASSOCIATION
in conjunction with the MALE NURSES' ASSN.
29, YORK ST., BAKER ST., LONDON, W.1
Mrs. MILLICENT HICKS, Superintendent W. J. HICKS, Secretary

CHISWICK HOUSE,
PINNER, MIDDLESEX.
Telephone: PINNER 234.

A Private Hospital for the Treatment and Care of Mental and Nervous Illnesses in both Sexes.
A modern country house, 12 miles from Marble Arch, in attractive and secluded surroundings. Fees from 10 guineas per week inclusive. Cases under Certificate, Voluntary and Temporary Patients received for treatment.
DOUGLAS MACAULAY, M.D., D.P.M.

STRETTON HOUSE,
Church Stretton, Shropshire.
ESTABLISHED IN 1853.
A PRIVATE HOME for the treatment of gentlemen suffering from Mental and Nervous illness, including the allied Disorders of Alcoholism and the Drug Habit. All types of early Mental and Nervous Cases are received without Certificates as Voluntary Patients under the provisions of the Mental Treatment Act, 1930. Bracing hill country. See "Medical Directory," p. 2358.—Apply to the Medical Superintendent. 'Phone 10 P.O., Church Stretton.

CITY OF LONDON MENTAL HOSPITAL
Near DARTFORD, KENT.
Ladies and Gentlemen received for treatment under certificates, and without certificates as either VOLUNTARY or TEMPORARY PATIENTS, at a weekly fee of £2 9s., and upwards.

THE GROVE HOUSE,
CHURCH STRETTON, SHROPSHIRE.
Private Home for Ladies mentally ill. Voluntary and Temporary Patients received.
Medical Superintendent: Dr. J. A. MCCLINTOCK.

HAYDOCK LODGE,
NEWTON-LE-WILLOWS, LANCASHIRE.
For the reception and treatment of PRIVATE PATIENTS of both sexes of the UPPER AND MIDDLE CLASSES suffering from Mental and Nervous Disorders, Alcoholism and Drug addiction, either voluntarily, temporarily, or under certificate. Patients are classified in separate buildings according to their mental condition. Situated in park and grounds of 400 acres. Self-supported by its own farm and gardens in which patients are encouraged to occupy themselves. Every facility for indoor and outdoor recreation. For terms, prospectus, etc., apply MEDICAL SUPERINTENDENT. *'Phone:* Ashton-in-Makerfield 7311. *Tele. Address:* Street, Ashton-in-Makerfield.

VALE OF CLWYD SANATORIUM
This Sanatorium is established for the treatment of Tuberculosis of the Lungs and the Pleural Cavities. It is situated in the midst of a large area of park-land at a height of 450 feet above sea-level, on the South West slopes of mountains rising to over 1800 feet, which protect it from north and east winds and provide many miles of graduated walks with magnificent views. Average rainfall 29·57 per annum. Full day and night Nursing Staffs. X-Ray plant. Every facility for Artificial Pneumothorax and for operations on the chest. Electric Lighting. Central Heating. Home Farm. Grade A Milk from T.T. Herd.
For particulars apply to Medical Superintendent.
H. MORRESTON DAVIES, M.D., M.Ch. (Cantab.), F.R.C.S., Llanbedr Hall, Ruthin, N. Wales.

HOLLOWAY SANATORIUM VIRGINIA WATER

A Registered Hospital for the Treatment of MENTAL DISORDERS of the EDUCATED CLASSES. Founded by THOMAS HOLLOWAY in 1885.

This Institution is situated in a beautiful and healthy locality within easy reach of London. It is fitted with every comfort. Patients can have Private Bedrooms and Special Nurses as well as the use of General Sitting Rooms, at moderate rates of payment. Voluntary Patients can be admitted.

There is a Branch Establishment at CANFORD CLIFFS, BOURNEMOUTH, where Patients can be sent for a change and be provided with all the comforts of a well-appointed home.

For Terms, apply to—
The RESIDENT MEDICAL SUPERINTENDENT, St. Ann's Heath, Virginia Water, SURREY

ST. ANDREW'S HOSPITAL

FOR NERVOUS AND MENTAL DISORDERS,

NORTHAMPTON

FOR THE UPPER AND MIDDLE CLASSES ONLY.

PRESIDENT: THE MOST HON. THE MARQUESS OF EXETER, K.G., C.M.G., A.D.C.

MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., M.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, bio-chemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods: insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombieres treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-Ray Room, an Ultra-violet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for bio-chemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a Park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: No. 2356 and 2357 Northampton), who can be seen in London by appointment

CHEADLE ROYAL HOSPITAL, Cheadle, Cheshire.

This REGISTERED HOSPITAL, with a SEASIDE BRANCH at Colwyn Bay, N. Wales, is for the treatment and care of those of the Upper and Middle Classes suffering from MENTAL AND NERVOUS DISEASES.

The Hospital is governed by a COMMITTEE, appointed by the TRUSTEES of the Manchester Royal Infirmary.

In addition to the Main Buildings there are separate villas. Extensive grounds. Hard and grass tennis courts, cricket and croquet grounds, and a court for badminton. There are also wireless installations. Golf may be had within easy distance. Occupational Therapy.

VOLUNTARY, TEMPORARY, AND CERTIFIED PATIENTS received.

The Hospital is nine miles from Manchester, 50 minutes by rail from Liverpool, and 3½ hours from London.

For terms and further particulars apply to the Medical Superintendent, who may be seen in Manchester BY APPOINTMENT. *Telephone: Gatley* 2231 (3 lines).

CAMBERWELL HOUSE

Telegrams: "PSYCHOLIA, LONDON." 33, PECKHAM RD., LONDON, S.E.5. Telephone: Rodney 4242 (2 lines).

For the treatment of MENTAL DISORDERS.

Also completely detached Villas for Mild Cases, with private suites if desired. Voluntary Patients received. Twenty acres of Grounds. Hard and Grass Tennis Courts, Putting Greens, Bowls, Croquet, Squash Rackets, Recreation Hall with Badminton Court, and all indoor amusements, including Wireless and other Concerts, Occupational Therapy, Calisthenics, and Dancing Classes. X-ray and Actino-therapy, Prolonged Immersion Baths, Operating Theatre, Pathological Laboratory, Dental Surgery, and Ophthalmic Department. Chapel. **Shock and also modified Insulin Therapy.**

Senior Physician: Dr. HUBERT JAMES NORMAN, assisted by a resident Medical Staff, and visiting Consultants.

An Illustrated Prospectus, giving fees which are strictly moderate, may be obtained upon application to the Secretary.

The Convalescent Branch is Hove Villa, Brighton, and is 200 feet above sea level.

THE COTSWOLD SANATORIUM

First opened in 1898 and rebuilt in 1935 on the Cotswold Hills seven miles from Cheltenham, for the Treatment of Pulmonary and all other forms of Tuberculosis. Aspect S.S.W., sheltered from North and East, elevation 800 feet. Pure bracing air, SPECIAL TREATMENT by artificial PNEUMOTHORAX (X-ray controlled). TUBERCULINS, and ULTRA-VIOLET RAYS is available when necessary without extra charge. X-RAY plant, Fully Equipped Dental Department, Electric Light Radiators, hot and cold basins and Wireless in all rooms. Up-to-date drainage. Full day & night Nursing Staff. **Terms: 5½ to 9½ Guineas a week inclusive.**

Med. Supt.: GEOFFREY A. HOFFMAN, B.A., M.B., T.C. Dub. *Asst. Phys.:* MARGARET A. HARRISON, M.B., B.S. Lond. *Cons. Laryngologist:* G. N. BARKER, F.R.C.S. Edin., D.L.O. *Cons. Dent. Surgeon:* GEORGE V. SAUNDERS, L.D.S.R.C.S. Lond. *Phone:* 81 & 82 Witcombe. Apply: *The Secretary, The Cotswold Sanatorium, Cranham, Gloucester Telegrams:* "Hoffman, Birdlip."

COURT HALL, KENTON, near EXETER

FOR THE TREATMENT OF EIGHT LADIES, VOLUNTARY, TEMPORARY AND CERTIFIED PATIENTS

CLIFFDEN, TEIGNMOUTH

FOR EARLY AND CONVALESCENT CASES Recreational Therapies are held daily by skilled Leaders

The house stands high with spacious balconies and extensive views of the South Devon Coast. Beautiful garden. Own Dairy in 25 acres. Private road to beach. There is also a charming house, **EBWORTHY, MANATON, DARTMOOR,** situated in 20 acres, 1100 ft. up for bracing moorland air.

Resident Physicians—BERTHA M. MULES, M.D., B.S. ANNE S. MULES, M.R.C.S., L.R.C.P.

Telephones—STARCROSS 259 and TEIGNMOUTH 289

PECKHAM HOUSE, 112, Peckham Road, London, S.E.15

Telegrams: "Alleviated, London" **Telephone: Rodney 2641-2642**

A Private Mental Hospital, for Ladies and Gentlemen suffering from Nervous and Mental Illness, where the amenities of a comfortable home are combined with full investigation and every well-established modern treatment.

Terms from 3½ guineas weekly.

Illustrated Prospectus may be obtained from the Physician Superintendent.

RUTHIN CASTLE, NORTH WALES

A Private Clinic, the first in Great Britain, for investigation and treatment of all forms of disease, except infectious and mental

There is a steel and concrete Air Raid Shelter with heating and a lift to all floors

Inclusive charges — Apply SECRETARY — Telephone: Ruthin 66

THE OLD MANOR SALISBURY

A Private Hospital for the Care and Treatment of those of both sexes suffering from MENTAL DISORDERS.

Extensive grounds. Detached Villas. Chapel. Garden and Dairy Produce from own farm. Terms very moderate.
CONVALESCENT HOME AT BOURNEMOUTH Detached Villas standing in 12 acres of ornamental grounds, with tennis courts, etc., which Voluntary, Temporary or Certified Patients may visit by arrangement for long or short period.
Illustrated Brochure on application to the Medical Superintendent. The Old Manor, Salisbury. Telephone: Salisbury 3216 and 3217.

THE CASSEL HOSPITAL FOR FUNCTIONAL NERVOUS DISORDERS

new address: ASH HALL, BUCKNALL, near STOKE-on-TRENT, STAFFS. *Telephone:* **ASH BANK 215**

Owing to existing circumstances the hospital has been transferred from Swaylands, Penshurst, Kent, to the above address for the duration of the war. Ash Hall is situated in the country about 5 miles from Stoke in the direction of Ashbourne.
The hospital will continue to admit for treatment patients of moderate means suffering from psychoneurotic illnesses.
Patients suffering from psychotic illnesses are not eligible for admission.
Further particulars may be obtained by application to the Medical Director at the new address.

THE LAW NURSING HOME ROCHDALE (Lancs)

Founder: The late SIR A. J. LAW, J.P., M.P.

A Private Hospital, exclusively for the treatment of POST-ENCEPHALITIC PARKINSONISM, PARKINSON'S DISEASE and ALLIED DISORDERS

The Nursing Home is governed by Trustees; any surplus is utilized to help patients who cannot afford full fees. Extensive grounds. Hydro. Expert Massage and Physical re-education. Dietary treatment. Equipped with every laboratory apparatus for the investigation and treatment of the diseases. Results of the BULGARIAN TREATMENT published (*Lancet*, 1939, 1, 693) approx.: 300 patients treated in the last 3 years. Terms moderate. Further particulars apply Medical Superintendent. Tel.: Rochdale 2960.

CRICHTON ROYAL, DUMFRIES For NERVOUS AND MENTAL DISORDERS

Separate Villa for patients suffering from the effects of alcoholism and drug addiction. Every facility for complete investigation and individual treatment on the most modern lines. Fully equipped gymnasium, golf course, and indoor swimming pool. Specially trained occupational and recreational therapists. **Special Department for Insulin Therapy.** As the hospital is well endowed terms are exceptionally moderate, e.g., First Department from 3 guineas per week, Second Department, 2 and 2½ guineas per week. Voluntary and certified patients are received. Medical Certificates given anywhere in the British Isles are valid for admission of patients. *For prospectus, necessary forms, and further information apply to:—*
Physician Superintendent. P. K. McCowan, J.P., M.D., F.R.C.P., D.P.M., Barrister-at-Law. Tel. Dumfries 1119

PORTSMOUTH CITY MENTAL HOSPITAL

Accommodation is provided for the reception of PRIVATE PATIENTS of both sexes in three detached Villas, which are healthily and pleasantly situated in extensive grounds with sea views.
Charges from 3 guineas weekly, including all necessaries except clothing.—Apply to the Medical Superintendent and Resident Physician, THOMAS BEATON, O.B.E., M.D., F.R.C.P.

FENSTANTON, at "FIVE DIAMONDS," Chalfont St. Giles, Bucks.

A Private Home for the Care and Treatment of a limited number of LADIES with Mental and Nervous Disorders. Certified, Voluntary, and Temporary Patients received. Mansion with 12 acres of ground. (*See Medical Directory*, p. 2346.) Apply Resident Physician. Telephone: Little Chalfont 2046. Station: Chalfont and Latimer.

MALLING PLACE, KENT

For LADIES and GENTLEMEN of Unsound Mind.
Terms moderate. Apply to Resident Medical Superintendent. Telegrams: ADAM WEST MALLING. Telephone No. 2: MALLING.

SPRINGFIELD HOUSE

'Phone: BEDFORD 3417. **Near BEDFORD**
For Mental Cases with or without Certificates.
Ordinary Terms: Five Guineas per week (including Separate Bedrooms for all suitable cases without extra charge).
For forms of admission, &c., apply to the Resident Physician, CEDRIC W. BOWER.
INTERVIEWS IN LONDON BY APPOINTMENT.

The Royal Waterloo Hospital,

Waterloo-road, S.E.1.

Applications are invited from registered medical practitioners (Male) for the appointment of a CASUALTY OFFICER AND HOUSE PHYSICIAN (A) to become vacant on 1st August, 1941, including R practitioners within three months of qualification. If held by an R practitioner, appointment will be for a period of six months. Salary is at the rate of £150 per annum, with full residential emoluments.
Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than the 23rd July, 1941.

J. H. TEASDALE, Secretary.

UNIVERSITY EXAMINATION POSTAL INSTITUTION

17, RED LION SQUARE, LONDON, W.C.1

Over 50 years' experience

POSTAL AND ORAL COACHING

FOR

ALL MEDICAL EXAMINATIONS

MEDICAL PROSPECTUS (36 pages),

sent gratis, along with List of Tutors, &c., on application to the Principal, 17, Red Lion-square, London, W.C.1. (Telephone: HOLborn 6312.)

London (Royal Free Hospital) School

OF MEDICINE FOR WOMEN.
(UNIVERSITY OF LONDON.)
AT UNIVERSITY COLLEGE OF THE SOUTH WEST, EXETER.

Applications are invited for the temporary appointment of DEMONSTRATOR in the ANATOMY DEPARTMENT at Exeter for the University Session 1941–42, at a salary of £250 for the Session.

Further particulars may be obtained from the undersigned, to whom applications should be sent by 9th August, 1941.

NANCIE MOLLER, Warden and Secretary.

Thomas Hall, Cowley-road, Exeter, July, 1941.

Examining Surgeons:

FACTORIES ACT, 1937.

The following appointments as Examining Surgeon under the Factories Act, 1937, are vacant.

Applications should be sent to the CHIEF INSPECTOR OF FACTORIES, 28, Broadway, S.W.1.

District	*County*	*Latest date for receipt of application*
KNOWBURY ..	SALOP	29th July, 1941
BISHOPSTOKE ..	SOUTHAMPTON ..	29th July, 1941

The South London Hospital for

WOMEN, Clapham Common, S.W.4.

Applications are invited from medical Women for the undermentioned appointments:—

One HOUSE PHYSICIAN and Two HOUSE SURGEONS for a period of six months from 1st September. Salary at the rate of £100 per annum, with full residential emoluments.

Candidates are required to call on members of the Hon. Medical Staff, and applications, stating age, nationality, qualifications with dates, and accompanied by copies of three recent testimonials, must reach the SECRETARY at the Hospital by 18th August.

National Temperance Hospital,

Hampstead-road, London, N.W.1.

Applications are invited from registered medical practitioners (British), Male or Female, for the post of MEDICAL REGISTRAR (B1), whose duties will include that of Blood Transfusion Officer under the M.S., which will become vacant as from 1st September.

Salary £350 per annum, with board, residence, and laundry. Suitably qualified R practitioners holding B2 or B1 posts may apply.

Applications, stating qualifications, &c., with copies of not more than three testimonials, by 31st July addressed to the SECRETARY.

National Temperance Hospital,

Hampstead-road, London, N.W.1.

Applications are invited from registered medical practitioners (British), Male or Female, for the appointment of CASUALTY OFFICER, who will be required to act as House Surgeon (B2) under the M.S. Suitably qualified R practitioners holding A posts may apply. The appointment is for a period of six months, with board, residence, and laundry. Salary at least £120 per annum.

Applications, stating qualifications, age, &c., with copies of not more than three testimonials, by the 31st July, to be addressed to the SECRETARY.

St. Mark's Hospital for Cancer,

FISTULA, AND OTHER DISEASES OF THE RECTUM, City-road, London, E.C.1.

Applications are invited from Male registered medical practitioners, including R practitioners who now hold A posts, for the appointment of a HOUSE SURGEON (B2), to become vacant on 1st September, 1941. Salary not less than £120 per annum. If held by an R practitioner, appointment will be for a period of six months.

Applications, with copies of testimonials, must reach the SECRETARY (from whom further particulars may be obtained) not later than 10 A.M. on 2nd August, 1941.

Royal Northern Hospital, Holloway,

N.7.

Applications are invited from registered medical practitioners, including R practitioners who now hold A posts, for the appointment of HOUSE PHYSICIAN (B2) to become vacant on 28th August, for a period of six months. Salary and emoluments approximately £125 per annum, and board, residence, and laundry.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 25th July.

GILBERT G. PANTER, Secretary.

Royal Northern Hospital, Holloway,

N.7.

Applications are invited from registered medical practitioners, including R practitioners who now hold A posts, for the appointment of HOUSE SURGEON (B2) to become vacant on 10th August, for a period of six months. Salary and emoluments approximately £125 per annum, and board, residence, and laundry.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 25th July.

GILBERT G. PANTER, Secretary.

Royal Free Hospital,

Gray's Inn-road, W.C.1.

Applications are invited from medical Women for the post of CLINICAL ASSISTANT in the GYNÆCOLOGICAL DEPARTMENT on Wednesday mornings.

Applications should reach the undersigned not later than 9th August, 1941. RICHARD T. BARTLEY, Secretary.

Royal Free Hospital,

Gray's Inn-road, W.C.1.

Applications are invited from registered medical practitioners for the appointment of RESIDENT MEDICAL OFFICER (B1). Suitably qualified R practitioners holding B2 or B1 posts may apply. If the successful candidate is not remunerated by the Emergency Medical Service, he or she will be paid by the Hospital at the rate of £150 per annum.

Applications, stating age and accompanied by copies of three recent testimonials, should be sent to the undersigned (from whom all information may be obtained) on or before the 9th August. Duties to commence 1st September, 1941.

RICHARD T. BARTLEY, Secretary.

King Edward Memorial Hospital,

Mattock-lane, Ealing, W.13.

Applications are invited from registered medical practitioners for the appointment of CASUALTY OFFICER AND HOUSE SURGEON (A), which includes duties in the Ear, Nose, and Throat, Dental, and Gynæcological Departments, vacant 14th August, 1941, including R practitioners within three months of qualification.

Appointment will be for a period of six months. Salary at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and accompanied by copies of two recent testimonials, should be sent to the undersigned immediately.

R. A. MICKELWRIGHT, House Governor.

King Edward Memorial Hospital,

Mattock-lane, Ealing, W.13.

Applications are invited from registered medical practitioners for the appointment of a HOUSE PHYSICIAN (A), to become vacant 1st August, including R practitioners within three months of qualification. Appointment will be for a period of six months; salary at the rate of £150 per annum, with usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of two recent testimonials, should be sent to the undersigned immediately.

R. A. MICKELWRIGHT, House Governor.

Resident Assistant Medical Officer

(ANÆSTHETIST) (B1) required by MIDDLESEX COUNTY COUNCIL for NORTH MIDDLESEX COUNTY HOSPITAL, Edmonton, N.18. Applicants must be registered medical practitioners (including suitably qualified R practitioners holding B2 or B1 posts) who have held resident appointments in general hospitals and had special experience in administering anæsthetics. Preference given to applicants holding the Diploma in Anæsthetics. Salary £400 by £25 to £475 per annum. Board, lodging, and laundry. Whole-time duties, under supervision of Medical Superintendent, will consist mainly in administering anæsthetics and such other duties as may be required. Appointment is for four years only, subject to medical examination and one month's notice.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, to the undersigned. Application forms not provided. Relationship to any member or officer of the Council to be disclosed. Copies of not more than three recent testimonials to be enclosed. Canvassing, directly or indirectly, will disqualify. Closing date 2nd August, 1941.

C. W. RADCLIFFE, "B3," Clerk of the County Council.
Middlesex Guildhall.

HIS MAJESTY'S COLONIAL SERVICE

THE COLONIAL MEDICAL SERVICE

VACANCIES FOR MEDICAL OFFICERS

The maintenance of an efficient Colonial Medical Service constitutes a vital part of the national war effort and it is most important that the Service should be assured of an adequate supply of doctors.

The Secretary of State for the Colonies therefore invites applications from doctors possessing a medical qualification registrable in the United Kingdom who are British subjects and who are under thirty-five years of age.

Medical Officers are appointed in the first instance for general service. But there are ample opportunities for work in special branches of medicine and surgery, in public health and in medical research.

The normal salary scale is from £600 to between £1,000 and £1,120. There are large numbers of super-scale posts to which promotion is made on merit and which carry higher salaries.

Government quarters, in many cases free of rent, and first-class passages to and from the Colonies are provided, and an adequate pension scheme is in force.

Selected candidates are normally required to attend a course of instruction in Tropical Medicine and Hygiene either before proceeding overseas or during their first period of leave.

Further particulars, including the regulations governing admission to the Colonial Medical Service, may be obtained from the Director of Recruitment (Colonial Service), 29, Queen Anne's-gate, London, S.W.1.

Royal National Orthopædic Hospital,
BROCKLEY HILL, STANMORE, MIDDLESEX.

Applications are invited from registered medical practitioners (Male or Female), including R practitioners holding A posts, for the appointment of RESIDENT HOUSE SURGEON (B2). There are two vacancies, one on August 1st, one on September 1st. The appointments are for six months. Salaries £200 per annum with board, quarters, laundry, &c.

Applications, stating age, nationality, qualifications and previous experience with copies of testimonials, should be sent to the SECRETARY, Royal National Orthopædic Hospital, 234, Great Portland-street, W.1, not later than July 22nd.

The Salvation Army,
THE MOTHERS' HOSPITAL,
Lower Clapton-road, Clapton, E.5.

Applications are invited from medical Women for the post of SENIOR RESIDENT MEDICAL OFFICER (B2), vacant middle of August, 1941. Salary £150 per annum, with board, residence, and laundry. The appointment is for six or twelve months.

Applications, with testimonials, must be sent to the Secretary not later than Saturday, 2nd August, 1941.

FRED HAMMOND, Secretary.

The Hospital for Sick Children,
Great Ormond-street, London, W.C.1.

Vacancies for a HOUSE PHYSICIAN (B2) and a HOUSE SURGEON (B2) will occur on the 1st October, 1941.

Applications are invited from registered medical practitioners, Male and Female, including R practitioners who hold A posts. The appointments are tenable for six months. The successful candidate must undertake to serve three of the six months at a Hospital in the Sector. Salaries at the rate of £100 per annum, with full residential emoluments.

Further particulars and forms of application, which must be returned not later than the 1st September, 1941, are obtainable from the undersigned.

HERBERT F. RUTHERFORD, Secretary.

July, 1941.

The Victoria Hospital for Children,
Tite-street, Chelsea, S.W.3.

APPOINTMENT OF RESIDENT MEDICAL OFFICER (B1).

Applications are invited from registered medical practitioners for the appointment of Resident Medical Officer to become vacant on 1st September. Applicants should have held a hospital appointment. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary is at the rate of £200 per annum.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 6th August, 1941.

D. ST. JOHN BAMFORD, Secretary.

Royal Infirmary, Bradford.

Applications are invited from registered medical practitioners Male) for the following appointments :—

One HOUSE PHYSICIAN (A) and Three HOUSE SURGEONS (A), including R practitioners within three months of qualification ;

One HOUSE PHYSICIAN (B2) and Two HOUSE SURGEONS (B2), including R practitioners who now hold A posts ;

to become vacant on 31st August. Six months' appointments. Salary £150 per annum, with board, residence, and laundry. There are 345 Beds and 10 Resident Officers.

Applications, stating age, nationality, qualifications, and previous experience, with copies of three recent testimonials, should be sent to the undersigned not later than 26th July.

H. TRUSSON, House Governor and Secretary.

2nd July, 1941.

British Postgraduate Medical School.
(UNIVERSITY OF LONDON.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE PHYSICIAN (A), including R practitioners within three months of qualification. The appointment is for six months from 1st September, and carries a salary of £105 per annum, plus the usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of three recent testimonials, should be sent not later than 5th August, 1941, to the DEAN, British Postgraduate Medical School, Ducane-road, London, W.12.

City of Liverpool.

CITY HOSPITAL NORTH (INFECTIOUS DISEASES HOSPITAL).

APPOINTMENT OF RESIDENT ASSISTANT MEDICAL OFFICER (B2).

Applications are invited from registered medical practitioners (Male and Female), including R practitioners who now hold A posts, for the appointment of Resident Assistant Medical Officer (B2) at City Hospital North (Infectious Diseases Hospital), Netherfield-road, Liverpool, 5.

If held by an R practitioner the appointment will be limited to six months, otherwise it will be for a period of twelve months. The salary is at the rate of £250 per annum, with full residential allowances. All fees received in connexion with the appointment to be handed over to the City Council. The appointment will be made in accordance with the Standing Orders of the City Council and will be determinable by one month's notice on either side.

Applications, upon forms obtainable from the Medical Officer of Health, Hospitals Department, Gordon House, Belmont-grove, Liverpool, 6, to be endorsed "Resident Assistant Medical Officer," and returned to the undersigned so as to be received not later than 10 A.M. on Monday, 28th July, 1941.

W. H. BAINES, Town Clerk.

Municipal Buildings, Dale-street, Liverpool, 2, July, 1941.

Bristol Royal Hospital
(incorporating BRISTOL ROYAL INFIRMARY and BRISTOL GENERAL HOSPITAL).

Applications are invited for the following resident appointments for the six months commencing 1st September, 1941 :—

Two HOUSE SURGEONS to the CASUALTY DEPARTMENTS; B2 posts for which suitably qualified R practitioners holding A posts may apply ;

and the following A posts for which R practitioners within three months of qualification may apply :—

Four HOUSE PHYSICIANS.

One HOUSE PHYSICIAN to the SKIN AND RADIOLOGICAL DEPARTMENTS.

Eight HOUSE SURGEONS.

Two HOUSE SURGEONS to the GYNÆCOLOGICAL DEPARTMENTS.

Two HOUSE SURGEONS to the E.N.T. DEPARTMENT.

One HOUSE SURGEON to the OUT-PATIENT FRACTURE DEPARTMENT.

One HOUSE SURGEON to the IN-PATIENT FRACTURE DEPARTMENT.

Salaries at the rate of £80 per annum, plus £20 per annum war bonus, except in the case of the Casualty House Surgeons, who will receive salaries at the rate of £150 per annum, plus £20 per annum war bonus.

Candidates, who must be registered medical practitioners, to send in their applications (on forms to be obtained from the undersigned) which must be returned on or before 31st July, 1941, together with copies of not more than three testimonials. The elected candidates must become members of a Medical Defence Association before taking up their appointment.

ELLIS C. SMITH, Secretary and House Governor.

Bristol Royal Infirmary.

County Borough of Merthyr Tydfil.

APPOINTMENT OF TEMPORARY ASSISTANT MEDICAL OFFICER OF HEALTH AND ASSISTANT SCHOOL MEDICAL OFFICER.

Applications are invited from medical Women (unmarried or widowed) under the age of forty for the above post. The person appointed must be a registered medical practitioner and registered in the Medical Register as the holder of a Diploma in Sanitary Science, Public Health, or State Medicine. Preference will be given to a candidate who—

(1) Has had at least three years' experience in the practice of her profession;
(2) Has held the appointment of Resident Medical Officer in a Maternity Department for a period of not less than six months;
(3) Has had not less than one year's continuous experience in some branch of obstetric work.

The duties will include school medical inspection, supervision of midwives, attendance at antenatal and infant welfare centres, and other public health duties as may from time to time be prescribed. The duties of the respective offices will be carried out under the general direction of the Medical Officer of Health.

The successful candidate will be required to pass a medical examination.

The salary will be at the rate of £500 per annum, rising by annual increments of £25 to a maximum of £700 per annum, together with out-of-pocket travelling expenses.

Applications, together with copies of three recent testimonials, must reach the undersigned on or before 26th July, 1941.

T. H. STEPHENS, Medical Officer of Health.

14th July, 1941.

City of Manchester.

ABERGELE SANATORIUM.
(262 Beds—210 Children, 52 Adults.)

APPOINTMENT OF RESIDENT ASSISTANT MEDICAL OFFICER (A).

Applications are invited from registered medical practitioners for the above-mentioned post which is vacant now, including R practitioners within three months of qualification. If held by an R practitioner the appointment will be for a period of six months.

The basic salary for the appointment commences at £350 per annum, rising by annual increments of £25 to a maximum of £450, or, if held by an R practitioner as above, £125 per annum, with board, residence, and laundry in addition. A temporary cost-of-living wages award is payable in addition to the foregoing salaries. At present the award amounts to £19 9s. 3d. on a salary of £350 and to £9 14s. 7d. on a salary of £125. The appointment is subject to the Manchester Corporation conditions of service.

Full information and forms of application may be obtained from the Medical Officer of Health, Hospitals Administration Section, P.O. Box No. 399, Town Hall, Manchester, 2, and applications for the post must be received by him not later than 30th July, 1941.

Canvassing in any form is prohibited.

R. H. ADCOCK, Town Clerk.

Town Hall, Manchester, 2, 14th July, 1941.

City Hospital, Chester.

APPOINTMENT OF RESIDENT MEDICAL OFFICER (B2).

Applications are invited from registered medical practitioners for the appointment of Resident Medical Officer, including R practitioners who now hold A posts. If held by an R practitioner the appointment will be limited to six months, otherwise it will be for a period of twelve months. The salary is at the rate of £200 per annum, with full residential emoluments.

Applications, together with three copies of recent testimonials, for the above post must be delivered to the MEDICAL OFFICER OF HEALTH, Town Hall, Chester, by Friday, the 25th July, 1941.

Canvassing will disqualify, and relationship to members of the Council must be disclosed.

The Duchess of York Hospital for BABIES, MANCHESTER. (80 Cots.)

Applications are invited from registered medical practitioners, Male or Female, for the appointment of JUNIOR RESIDENT MEDICAL OFFICER (A), now vacant, including R practitioners within three months of qualification, when appointment will be for a period of six months. Appointment is to the 31st December, 1941, with salary at the rate of £100 per annum, including full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three testimonials, to be sent to the undersigned immediately.

LOUISE GILLESPIE, Secretary.

Ancoats Hospital, Manchester, 4.

HOUSE SURGEON (A), General (Male or Female). R practitioners within three months of qualification may apply. Salary £110 per annum, with board, residence, &c. Appointment for six months.

Apply at once, stating age, qualifications, &c., enclosing three recent testimonials.

HERBERT J. DAFFORNE,
General Superintendent and Secretary.

Royal Manchester Children's Hospital, PENDLEBURY.

Applications are invited from registered medical practitioners, Male and Female (including R practitioners within three months of qualification), for the post of ASSISTANT MEDICAL OFFICER (A) at the OUT-PATIENTS' DEPARTMENT, Gartside-street, Manchester, to become vacant on 1st September next. The appointment will be for a period of six months, and the salary is at the rate of £150 per annum. The hours of duty at the Out-patients' Department are from 9 A.M. until 1 P.M., or until the work of the department is finished. Preference will be given to candidates able to take up residence at the Hospital, Pendlebury, for evening relief duties.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than Friday, 1st August, 1941.

By Order,
H. HEARDMAN, General Superintendent and Secretary.

Royal Manchester Children's Hospital, PENDLEBURY, Near MANCHESTER.

RESIDENT MEDICAL OFFICER (B1 APPOINTMENT).

Applications are invited for the post of Resident Medical Officer. Salary £150 per annum. The appointment is for a period of six months commencing 1st September, 1941. Candidates must be unmarried. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply.

Applications, stating age and accompanied by copies of not more than three recent testimonials, to be sent to the undersigned not later than Friday, 1st August. Canvassing, directly or indirectly, may disqualify.

By Order,
H. HEARDMAN, General Superintendent and Secretary.

Royal Manchester Children's Hospital, PENDLEBURY.

Applications are invited from registered medical practitioners, Male and Female (including R practitioners within three months of qualification), for the appointment of HOUSE SURGEON (A) to become vacant on 1st September. The appointment is for a period of six months, and the salary is at the rate of £100 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, to be sent to the undersigned not later than Friday, 1st August, 1941.

By Order,
H. HEARDMAN, General Superintendent and Secretary.

South-West Salop United Districts.

APPOINTMENT OF MEDICAL OFFICER OF HEALTH.

The Joint Committee for the South-West Salop United Districts invite applications for the appointment of a Medical Officer of Health for the district comprising the Boroughs of Wenlock and Bishop's Castle, the Urban District of Church Stretton, and the Rural Districts of Atcham and Clun.

Applicants must possess the qualifications prescribed in Article 8 of the Sanitary Officers (Outside London) Regulations, 1935. The person appointed will be required to carry out all the duties of a Medical Officer of Health and to devote the whole of his time to the duties of his office.

The salary will be £800 per annum, with travelling allowance on the Salop County Council Scale, payment of postage and other expenses, and an allowance for the provision of an office.

Applications, accompanied by copies of recent testimonials, must be forwarded to reach me not later than Saturday, 9th August, 1941, endorsed "M.O.H."

E. P. EVEREST, Clerk of the Joint Committee.

Council Offices, 24, St. John's-hill, Shrewsbury,
14th July, 1941.

The Prince of Wales's Hospital, GREENBANK ROAD, PLYMOUTH.

Applications are invited from registered medical practitioners for the appointment of a HOUSE PHYSICIAN (A) to become vacant on 10th September, including R practitioners, within three months of qualification. If held by an R practitioner, appointment will be for a period of six months. Salary is at the rate of £132 per annum, with full residential emoluments.

Applications, stating age, qualifications, with dates and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 31st July.

ARTHUR R. CASH, General Superintendent.

The Children's Hospital, Sheffield (Inc.) (157 Beds.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of a HOUSE PHYSICIAN (A), to become vacant on the 1st August, 1941, including R practitioners within three months of qualification. Appointment is for a period of six months. Salary at the rate of £100 per annum, with full residential emoluments.

Applications, stating age, qualifications, with dates and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned. The successful candidate must be a member of a Medical Defence Society.

T. H. G. GARTLAND, Superintendent and Secretary.

County Council of Essex and Urban District Council of Thurrock.

ADDITIONAL ASSISTANT COUNTY MEDICAL OFFICER AND ASSISTANT MEDICAL OFFICER OF HEALTH.

Applications are invited for the above-mentioned appointments.

The total salary of the person appointed will be within the scale of £500 per annum, rising, subject to satisfactory service, by annual increments of £25 to £700 per annum, but the commencing salary will not necessarily be fixed at the minimum. Seven-elevenths of the commencing salary will be paid by the Urban District Council of Thurrock and the remainder by the Essex County Council.

A travelling allowance of £10 per annum is payable by the District Council, and a mileage allowance is payable by the Essex County Council for use of the officer's own car.

Applicants, Male or Female, must be duly qualified medical practitioners with special experience in Obstetrics and hold a Diploma in Public Health.

The person appointed will be required to pass a medical examination, to contribute to the Superannuation Funds established by each authority, and to reside in the Urban District of Thurrock.

The appointment to the office of Assistant County Medical Officer will be subject to the Sick Pay Rules and Regulations of the County Council, a copy of which will be forwarded on application.

Applications on the prescribed form, which is obtainable from the undersigned, John E. Lightburn, should be delivered at the County Hall, Chelmsford, not later than 10 A.M. on Monday, the 28th day of July, 1941.

JOHN E. LIGHTBURN,
Clerk of the County Council.

A. E. POOLE,
Clerk to the Urban District Council of Thurrock.

County Hall, Chelmsford, 7th July, 1941.

City of Carlisle.

CITY GENERAL AND FUSEHILL HOSPITALS.

Applications are invited from registered medical practitioners for the appointment of JUNIOR RESIDENT MEDICAL OFFICER (A), including R practitioners within three months of qualification. The salary for the post is at the rate of £120 per annum, with full residential emoluments. If held by an R practitioner, the appointment will be for a period of six months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the MEDICAL OFFICER OF HEALTH, 22, Fisher-street, Carlisle, not later than the 24th July, 1941.

The Corbett Hospital, Stourbridge, WORCS.

(100 Beds, Special Departments, and Emergency Beds.)

APPOINTMENT OF HOUSE PHYSICIAN (A).

Applications are invited from registered medical practitioners, Male and Female, for the appointment of House Physician (A), to become vacant on 1st August, 1941, including R practitioners within three months of qualification. The appointment will be made for six months. Salary is at the rate of £125, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned forthwith.

W. G. H. WESTON, Secretary.

Coventry and Warwickshire Hospital.

(Out-patient Department in Coventry;
In-patient Beds in Branch Hospitals outside Coventry.)

APPOINTMENT OF HOUSE SURGEON (A) AND APPOINTMENT OF HOUSE PHYSICIAN (A).

Applications are invited from registered medical practitioners (Male and Female), including R practitioners within three months of qualification, for the above appointments, which are vacant immediately. The appointments are for a period of six months commencing 1st July, and if held by non-R practitioners may be renewed upon application. Salary at the rate of £150 per annum, together with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

S. CECIL HILL, House Governor and Secretary.

Royal Northern Infirmary, Inverness.

Applications are invited from registered medical practitioners for the appointment of Two HOUSE SURGEONS (A), Male: One for Eye, Ear, Nose, and Throat Department, to become vacant on 31st August, and One for General Surgery, to become vacant on 30th September; also for the appointment of HOUSE PHYSICIAN (A), Male, to become vacant on 31st July.

If held by R practitioners, appointments will be for a period of six months. Salary is at the rate of £100 per annum, with full residential emoluments. R practitioners who have been qualified for more than three months must have obtained the sanction of the Scottish Central Medical War Committee to their application.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned.

T. C. MACKENZIE, M.D., Medical Superintendent.

Derbyshire Education Committee.

SCHOOL MEDICAL SERVICE.

TEMPORARY ASSISTANT SCHOOL MEDICAL OFFICER.

Applications are invited for the post of Temporary Assistant School Medical Officer at a salary of £500 per annum, rising by annual increments of £25 to £700 per annum, together with a travelling allowance in accordance with the County Scale.

Candidates must be registered medical practitioners of at least three years' standing. The duties will include work under the Maternity and Child Welfare Service, and experience in this work and in Mental Deficiency is desirable.

Applicants may be of either sex, but in the case of males they should be over thirty-five years of age.

The appointment will be subject to superannuation under the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination.

The officer appointed will not be allowed to engage in private or consulting practice, but will be required to devote the whole time to the duties of the office and will act under the direction of the School Medical Officer.

Forms of application may be obtained from the undersigned to whom they should be returned completed, together with copies of not more than three recent testimonials, on or before 28th July, 1941, endorsed "Temporary Assistant School Medical Officer."

The appointment will be terminable by three months' notice on either side.

W. M. ASH, School Medical Officer.

County Offices, St. Mary's Gate, Derby.

Addenbrooke's Hospital, Cambridge.

APPOINTMENT OF HOUSE SURGEON TO THE FRACTURE AND ORTHOPÆDIC DEPARTMENT (A).

Applications are invited from registered medical practitioners (unmarried), Male and Female, for the appointment of House Surgeon to the Fracture and Orthopædic Department (A), including R practitioners within three months of qualification. The appointment will commence as soon as possible, and is for a period of six months, but is terminable at an earlier date by one month's written notice on either side. Salary is at the rate of £130 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not, later than Wednesday, 23rd July.

J. A. BEARDSALL, Secretary-Superintendent.

County of East Suffolk.

Qualified medical practitioners are invited to apply for the post of TEMPORARY ASSISTANT MEDICAL OFFICER OF HEALTH. The vacancy will occur when the present holder, who has volunteered for service, is called up.

The salary will be at the rate of £600 a year, rising by £50 a year to £800 a year. The appointment is a whole-time one, and the successful candidate will not be allowed to engage in private practice.

Application forms can be obtained from the COUNTY MEDICAL OFFICER at the County Hall, Ipswich, to whom they should be returned by 25th July, 1941.

Manchester Royal Eye Hospital.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of a HOUSE SURGEON (A), now vacant, including R practitioners within three months of qualification. If held by an R practitioner, appointment will be held for a period of six months. Salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned.

H. R. NORTH, General Superintendent and Secretary.

Huddersfield Royal Infirmary.

(321 Beds.)

Male HOUSE SURGEON (an A appointment) required to commence duty on 31st July, 1941. R practitioners within three months of qualification may apply, when the appointment will be for a period of six months; otherwise subject to renewal for a similar period of six months. Salary £150 per annum, with board, residence, and laundry. The Hospital is officially recognised for the surgical practice required of non-members before admission to the Final Fellowship Examination of the Royal College of Surgeons of England.

Applications, with copies of three recent testimonials, to be addressed to the undersigned.

H. J. JOHNSON, General Superintendent and Secretary.

Children's Hospital, Nottingham.

Applications are invited for the post (B1) of RESIDENT HOUSE SURGEON (Woman). The salary will be at the rate of £200 per annum, with apartments, board, and laundry. The appointment will be for six months, duties to commence on the 1st September, 1941.

Applications, together with testimonials, stating age, nationality, qualifications, and experience, to be sent to the HONORARY SECRETARY, 1, King John's Chambers, Bridlesmith Gate, Nottingham, on or before Tuesday, 22nd July, 1941. Selected candidates will be required to attend at the Hospital for a personal interview.

City of Liverpool.

ALDER HEY CHILDREN'S HOSPITAL.

APPOINTMENT OF RESIDENT ASSISTANT MEDICAL OFFICER (B2).

Applications are invited from registered medical practitioners (Male and Female), including R practitioners who now hold A posts, for the appointment of Resident Assistant Medical Officer (B2) at the above Hospital.

Preference will be given to candidates with experience in children's diseases. If held by an R practitioner the appointment will be limited to six months, otherwise it will be for a period of twelve months. The salary is at the rate of £200 per annum, with full residential allowances. All fees received in connexion with the appointment to be handed over to the City Council. The appointment will be made in accordance with the Standing Orders of the City Council and will be determinable by one month's notice on either side.

Applications, upon forms obtainable from the Medical Officer of Health, Hospitals Department, Gordon House, Belmont-grove, Liverpool, 6, to be endorsed "Resident Medical Officer" and returned to the undersigned so as to be received not later than 10 A.M. on Monday, 28th July, 1941.

W. H. BAINES, Town Clerk.

Municipal Buildings, Dale-street, Liverpool, 2,
5th July, 1941.

County of Warwick.

PUBLIC ASSISTANCE COMMITTEE.

The above Committee invite applications for the appointment of a Whole-time CONSULTING PHYSICIAN in connexion with their Hospital services and which is included in the Emergency Hospital Scheme of the Ministry of Health.

The person appointed will be required regularly to visit the several hospitals in the county under the Council's administration and will not be permitted to undertake private practice.

Applicants must be Fellows or Members of the Royal College of Physicians.

The salary of the office will be at the rate of £1200 per annum, rising by annual increments of £50 to £1400 per annum, and travelling allowances will be payable in accordance with the Council's scale. The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937.

Applications, stating age, qualifications, and experience, together with copies of three recent testimonials, should be sent to the Public Assistance Officer, Shire Hall, Warwick, not later than Wednesday, the 30th July, 1941.

L. EDGAR STEPHENS, Clerk of the Council.

Shire Hall, Warwick, 11th July, 1941.

Warwickshire and Coventry Joint COMMITTEE FOR TUBERCULOSIS.

KING EDWARD VII MEMORIAL SANATORIUM, HERTFORD HILL, Near WARWICK.

APPOINTMENT OF JUNIOR ASSISTANT MEDICAL OFFICER (R and B2).

Applications are invited from registered medical Women practitioners (R and B2 groupe) for the appointment of Junior Assistant Medical Officer at the above Sanatorium. The appointment will be for six months and may be renewed in the case of B2 practitioners for a further period of six months. The salary is at the rate of £250 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the Medical Superintendent, King Edward VII Memorial Sanatorium, Hertford Hill, near Warwick, not later than 31st July, 1941.

L. EDGAR STEPHENS, Clerk to the Joint Committee.

Shire Hall, Warwick, 11th July, 1941.

Cornwall County Council.

CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST.

Applications are invited for the post of part-time Consultant Obstetrician and Gynæcologist. The remuneration offered is at the rate of £1000 per annum for a period of three years and at the rate of £600 per annum subsequently. Travelling expenses will be paid in accordance with the County Scale.

The Consultant appointed will be required to reside in the vicinity of Redruth, to attend in any part of the administrative county as required, but to associate himself particularly with the County Maternity Ward at the Camborne-Redruth Miners' and General Hospital. A more detailed list of duties can be obtained from the County Medical Officer upon application.

Applications, accompanied by not more than three recent testimonials, should be addressed to the County Medical Officer, County Hall, Truro, not later than Friday, 1st August, 1941.

E. T. VERGER, Acting Clerk of the County Council.

Bromley and District Hospital.

Applications are invited from qualified medical practitioners (Male), including R practitioners within three months of qualification, for the post of HOUSE SURGEON (A), starting 1st August, 1941, with full residential emoluments. Appointment six months, starting salary £162 10s.

Applications, stating age and qualifications, accompanied by recent testimonials, should be sent to the SECRETARY by 22nd July, 1941.

Essex County Council.

OLDCHURCH COUNTY HOSPITAL, ROMFORD.

The County Council of the Administrative County of Essex invite applications for the following appointments at the above Hospital:—

(1) TEMPORARY CONSULTANT PHYSICIAN with special knowledge of nervous diseases to undertake one session per week at a salary at the rate of £200 per annum. First-class railway fare or car mileage in accordance with the Council's scale will be paid.

(2) Whole-time SENIOR PHYSICIAN at a salary of £750 per annum, rising, subject to satisfactory service, by annual increments of £50 to £1000 per annum.

Forms of application and further particulars of the appointments may be obtained from the undersigned.

Applications, accompanied by copies of not more than three recent testimonials (which will not be returned), should be enclosed in an endorsed envelope addressed to me and delivered at the County Hall, Chelmsford, not later than 10 A.M. on Wednesday, the 6th day of August, 1941.

JOHN E. LIGHTBURN, Clerk of the County Council.

County Hall, Chelmsford, 9th July, 1941.

County Borough of South Shields.

APPOINTMENT OF DEPUTY MEDICAL OFFICER OF HEALTH.

Applications are invited from registered medical practitioners for the above-mentioned appointment.

Applicants should be not more than forty-five years of age and must possess the Diploma in Public Health. Experience in Air-Raid Precautions would be considered an advantage.

The salary will be at the rate of £660 per annum, rising by annual increments of £25 to £700 per annum, together with £50 per annum car allowance.

Forms of application may be obtained from the undersigned, and should be returned, together with copies of three testimonials, not later than 10 A.M. on Tuesday, the 29th July, 1941, in an envelope endorsed "Deputy Medical Officer of Health."

Canvassing in any form will disqualify.

HAROLD AYREY, Town Clerk.

Town Hall, South Shields, 12th July, 1941.

The King Edward VII Welsh National MEMORIAL ASSOCIATION.

Applications are invited from registered medical practitioners, Male and Female, for the undermentioned appointments, including R practitioners who now hold A posts. If held by R practitioners, appointments will be limited to six months; otherwise they will be for a period of one year:—

(1) JUNIOR ASSISTANT RESIDENT MEDICAL OFFICER (B2) at the SOUTH WALES SANATORIUM, TALGARTH, BRECS. (286 Beds for the treatment of pulmonary tuberculosis in males.)

(2) JUNIOR ASSISTANT RESIDENT MEDICAL OFFICER (B2) at the NORTH WALES SANATORIUM, DENBIGH. (247 Beds for pulmonary female patients, and surgical tuberculosis in men, women, and children.)

The salary is at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than Friday, 25th July, 1941.

D. A. POWELL, Principal Medical Officer.

Memorial Offices, Cathays Park, Cardiff,
14th July, 1941.

Royal Gwent Hospital, Newport, Mon.

Applications are invited from registered medical practitioners with previous experience in fractures and orthopædics, Male or Female, for the appointment of HOUSE SURGEON to the FRACTURE AND ORTHOPÆDIC DEPARTMENT (B2) now vacant, including R practitioners who now hold A posts. If held by an R practitioner the appointment will be limited to six months.

The salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned at once.

ALAN RUDDLE, Secretary-Superintendent.

11th July, 1941.

Staffordshire County Council.

STANDON HALL ORTHOPÆDIC HOSPITAL, Near ECCLESHALL, STAFFORD. (120 Beds.)

RESIDENT MEDICAL OFFICER (B1).

Applications are invited for the above-mentioned post from suitably qualified non-alien registered medical practitioners, including R practitioners holding B2 or B1 appointments. The salary is at the rate of £350 per annum, with full residential emoluments, and the appointment, which in the first instance will be for one year, will be subject to one month's notice. The Hospital will have an E.M.S. Fracture Department (A).

Applications, together with copies of three recent testimonials, must reach the undersigned by the 31st July, 1941.

H. L. UNDERWOOD, Clerk of the County Council.

County Buildings, Stafford, 14th July, 1941.

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Editorial Office Address 26, Temple Street, Aylesbury, Bucks (Aylesbury 315).
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, July 19, 1941.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.

General Hospital, Nottingham.
(501 Beds.)

Applications are invited from registered medical practitioners (Male or Female), including R practitioners within three months of qualification, for the appointment of a HOUSE PHYSICIAN (A) for the above Hospital. The appointment is for six months. Duties to commence on or about 24th July. Salary at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and copies of testimonials, should be sent to the undersigned.

HENRY M. STANLEY, House Governor and Secretary.

Hull Corporation Health Department.

BEVERLEY ROAD HOSPITAL.

TEMPORARY ASSISTANT MEDICAL OFFICER (B1).

Applications are invited for the above temporary appointment from registered medical practitioners of either sex, who must be under the age of forty years. Salary £350 per annum, rising by annual increments of £25 to £450 per annum, together with board, residence, laundry, &c. R practitioners holding B2 or B1 appointments are invited to apply.

The Hospital forms part of the M.S. Scheme as a Casualty Clearing Hospital.

Forms of application, &c., may be obtained from, and returned duly completed to, the MEDICAL OFFICER OF HEALTH, Guildhall, Hull, not later than 10 A.M. on Monday, the 28th July, 1941.

Grimsby and District Hospital.

APPOINTMENT OF RESIDENT CASUALTY OFFICER (B2).

Applications are invited from registered medical practitioners, including R practitioners who hold A posts, for the appointment of Resident Casualty Officer (B2). If held by an R practitioner the appointment is limited to six months. Salary is at the rate of £175 per annum, with residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by three recent testimonials, should be sent to the undersigned at once.

July 8th, 1941. H. B. COATES, Secretary-Superintendent.

Rochdale Infirmary and Dispensary,
LANCS. (110 Beds.)

APPOINTMENT OF HOUSE SURGEON (A).

The Board of Management invites applications for the appointment of House Surgeon (A), appointment now vacant, including R practitioners within three months of qualification. If held by an R practitioner, appointment will be for a period of six months. Salary attached to the appointment is at the rate of £150 per annum, including board, residence, and laundry.

Applications, stating age, nationality, &c., together with copies of three recent testimonials, to be sent to the Secretary. The successful candidate must be a member of a medical defence society. W. WYNNE, Secretary.

Infirmary Office, Rochdale.

Preston and County of Lancaster Royal
INFIRMARY, PRESTON.

CASUALTY OFFICER (B2) required for 1st August, 1941. Class 1A Hospital. Six months' appointment. R practitioners, including those now holding A posts, are invited to apply. Salary at the rate of £175 per annum, with the usual residential allowances.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copy testimonials, to be forwarded to Mr. JOHN GIBSON, Superintendent, Royal Infirmary, Preston.

Royal West Sussex Hospital,
CHICHESTER. (334 Beds.)

APPOINTMENT OF RESIDENT MEDICAL OFFICER (B2).

Applications are invited from registered medical practitioners, Male and Female, for the appointment of Resident Medical Officer (B2), to become vacant on 25th July, 1941, including R practitioners who now hold A posts. The appointment will be limited to six months. The salary is at the rate of £250 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

K. H. WILLIAMS, House Governor.

Manchester Northern Hospital
(General Hospital—113 Beds),
Cheetham Hill-road, MANCHESTER, 8.

Applications are invited from registered medical practitioners, Male and Female, including R practitioners within three months of qualification, for the post of RESIDENT HOUSE PHYSICIAN (A). Salary £100 per annum, with board and residence.

The appointment is for six months from 21st July, 1941.

Applications, stating age, qualifications, and nationality, with copies of not less than three recent testimonials, should be sent to Mr. JAMES C. DANIELS, Secretary, 38, Barton-arcade, Manchester, 3, as soon as possible.

Royal Albert Edward Infirmary and
DISPENSARY, WIGAN.
(Normally 189 Beds.)

APPOINTMENT OF A HOUSE SURGEON (A).

Applications are invited from registered medical practitioners (Male), including R practitioners within three months of qualification, for the appointment of a House Surgeon (A), to become vacant on 1st October, 1941. If held by an R practitioner, appointment will be for a period of six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned as soon as possible.

A. STANLEY BRUNT, General Superintendent and Secretary.
12th July, 1941.

County Council of The West Riding of
YORKSHIRE.

MIDDLETON-IN-WHARFEDALE SANATORIUM AND HOSPITAL.
(600 Beds.)

Applications are invited from registered medical practitioners for the appointment of TEMPORARY DEPUTY MEDICAL SUPERINTENDENT (Resident) at the Middleton-in-Wharfedale Sanatorium and Hospital, near Ilkley.

Candidates must have held resident hospital appointments and have had experience in the diagnosis and treatment of tuberculosis. Possession of a higher qualification in medicine will be considered an advantage. Salary £450, rising by annual increments of £25 to £550, together with the usual residential allowances.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the County Medical Officer, County Hall, Wakefield, not later than 29th July, 1941.

J. CHARLES MCGRATH, Clerk of the County Council.
County Hall, Wakefield, July, 1941.

Royal Infirmary, Preston.

Applications are invited from registered medical practitioners, including R practitioners within three months of qualification, for the following appointments vacant the 31st July, 1941:—

HOUSE SURGEON (A). Duties under Consultant Surgeon.

EYE, EAR HOUSE SURGEON, under specialist Surgeons.

Six months' appointments.

Salary in each case at the rate of £150 per annum, with the usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, together with testimonials, should be sent to the SUPERINTENDENT, Royal Infirmary, Preston, as soon as possible.

Partner required in rapidly increasing

natural therapy PRACTICE. Principal is willing to train incoming partner in dietetics, manipulation, and hydrotherapy. An interest could also be acquired later in a clinic which is to be opened in Cheshire for resident patients and as a training centre.—Address, No. 802, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Gloucestershire.—In the Cotswold

Country, unopposed Country PRACTICE averaging over £1000 a year, panel 600, appointments about £80; easily worked. Modern house, 5 bedrooms, with central heating, main water, electric light, h. & c. basins. Garage for two; well-stocked garden with tennis lawn—all in perfect order. Practice with house, drugs, instruments, &c., £5000. Selling owing to ill-health. No agents.—Address, No. 795, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Medical Practice for Sale, Sheffield.

Good panel. House to rent. Nearly £1700 income. Price £2000.—Address, No. 798, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Medical Practice for Sale, Leeds.

Good panel. Good income. House to rent.—Address, No. 799, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Wanted, Austin or similar Saloon,

1937–39. New condition.—Address, No. 801, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

ESTABLISHED 1845.

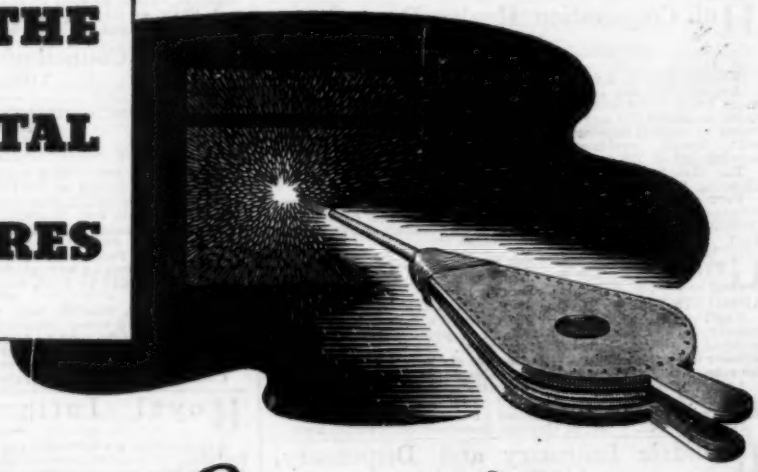
ELLIOTT, SON AND BOYTON
(H. C. ROWE, F.S.I.),
86/87, WIMPOLE STREET, W.1,
Estate Agents, Auctioneers, and Surveyors,

are the BEST LOCAL AGENTS for HOUSES and CONSULTING ROOMS in the Harley, Wimpole, Queen Anne, and other Streets in the Cavendish-square district. Valuations for all purposes.

Telephone: WELBECK 8367 (4 lines).

Stimulant

OF THE VITAL CENTRES



BRITISH MADE **Coramine** TRADE MARK REGISTERED

BRAND OF NIKETHAMIDE B.P.

Large doses at the critical moment
Small doses for prolonged treatment

"5 c.cm. of Coramine given intravenously is the most wonderful restorative at one's disposal . . It is so dramatically effective that it often brings the patient round to full consciousness within sixty seconds of administration."

J. R. Naval med. Service (1940), 2, 138.

A booklet, *Coramine, Stimulant of the Vital Centres*, will be sent on request to members of the Medical and Allied Professions. Samples are also available for clinical trial.

Ciba Limited

THE LABORATORIES, HORSHAM, SUSSEX

TELEPHONE: HORSHAM 1234 TELEGRAMS: CIBALABS, HORSHAM